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Washington, D.C. 20554

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In the Matter of)

Implementation of Section 6002(b) of the
Omnibus Budget Reconciliation Act of 1993)

WT Docket No. 04-111

Annual Report and Analysis of Competitive
Market Conditions With Respect to Commercial
Mobile Services)

NINTH REPORT

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By the Commission: Chairman Powell issuing a statement; Commissioner Copps concurring and issuing a statement.

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I. EXECUTIVE SUMMARY

1. This report reviews competitive market conditions with respect to commercial mobile radio services ("CMRS") using a framework that groups indicators of the status of competition into four categories: (1) market structure; (2) carrier conduct; (3) consumer behavior; and (4) market performance. The report also examines a number of related topics of interest to the Commission, including urban-rural and international comparisons, wireless-to-wireline competition, and Wi-Fi.

2. In this report the Commission concludes that there is effective competition in the CMRS marketplace. Among the indicators of market structure that form the basis for this conclusion, we note that 97 percent of the total U.S. population lives in counties with access to three or more different operators offering mobile telephone service, up from 95 percent in the previous year, and up from 88% in 2000, the first year for which these statistics were kept. In addition, there were somewhat larger increases in the percentage of the U.S. population living in counties with access to 4 or more, 5 or more, 6 or more, and 7 or more different mobile telephone operators in the past year. These increases indicate that competition is robust in terms of the current number of competitors per market, and also that spectrum availability and other key determinants of entry conditions are favorable to continued competitive entry at the local level.

3. With respect to carrier conduct, the record indicates that competitive pressures continue to compel carriers to introduce innovative pricing plans and service offerings, and to match the pricing and service innovations introduced by rival carriers. Price rivalry is evidenced by the continued expansion of pricing innovations such as free night and weekend minutes and free mobile-to-mobile calling among an individual carrier's customers. A notable example of non-price rivalry is that several mobile operators have recently introduced push-to-talk ("PTT") services to compete with Nextel's signature PTT offering. In addition, the deployment of competing technological standards continues to be an important dimension of non-price rivalry in the U.S. mobile telecommunications market. The carriers using TDMA/GSM as their second-generation digital technology continue deploying or planning to deploy the next-generation technologies on the GSM migration path, including General Packet Radio Services ("GPRS"), Enhanced Data Rates for GSM Evolution ("EDGE"), and eventually Wideband CDMA ("WCDMA"). Similarly, many CDMA carriers have been upgrading their networks to CDMA2000 1xRTT, and both Verizon Wireless and Sprint PCS have begun deploying a high-speed wireless data network using CDMA2000 1X EV-DO (evolution-data only, "EV-DO"), the next step in the CDMA migration path after 1xRTT. In addition to investing in network deployment and upgrades, certain carriers have continued to pursue marketing strategies designed to differentiate their brands from rival offerings with regard to various aspects of network performance such as geographic coverage, voice quality, and wireless data speeds.

4. Indicators of market performances show that competition continues to afford many significant benefits to consumers. Consumers continue to contribute to pressures for carriers to compete on price and other terms and conditions of service by freely switching providers in response to differences in the cost and quality of service. Average monthly churn rates remain at about 1.5 to 3.5 percent per month. In addition, the implementation of local number portability ("LNP") beginning in November 2003 has lowered consumer switching costs by enabling wireless subscribers to keep their phone numbers when changing wireless providers. While to date the advent of LNP does not appear to have resulted in an increase in churn, there is evidence to suggest that competitive pressure on carriers to retain existing customers has increased as a result of LNP.

5. In the 12 months ending December 2003, the United States mobile telephony sector increased subscribership from 141.8 million to 160.6 million, raising the nationwide penetration rate to approximately 54 percent of the population. Mobile subscribers continued to increase the amount of time they spend talking on their mobile phones, with average minutes of use per subscriber per month rising to more than 500 minutes in the second half of 2003 from 427 minutes in 2002 and 255 minutes in 2000. Moreover, although U.S. mobile subscribers still prefer to use their mobile phones to talk rather than to send text messages ("SMS"), the popularity of text messaging and other handset-based leisure and entertainment applications increased during 2003 as evidenced by, among other indicators, a steep rise in the volume of SMS traffic and an increase in the estimated percentage of U.S. mobile subscribers considered to be casual data users. Evidence on mobile pricing trends is somewhat mixed, with two different indicators of mobile pricing - revenue per minute and the cellular Consumer Price Index ("CPI") - continuing to drop, and a third indicator based on the consumption patterns of hypothetical users showing a slight increase in the cost of mobile service from \$35.70 in 2002 to \$36.46 in 2003. Nevertheless, international comparisons indicate that mobile voice calls are still far less expensive on a per minute basis in the United States than in Western Europe.

II. INTRODUCTION

A. Background

6. In 1993, Congress created the statutory classification of Commercial Mobile Services¹ to promote the consistent regulation of mobile radio services that are similar in nature.² At the same time, Congress established the promotion of competition as a fundamental goal for CMRS policy formation and regulation. To measure progress toward this goal, Congress required the Federal Communications Commission ("FCC" or "Commission") to submit annual reports that analyze competitive conditions in the industry.³ This report is the ninth of the Commission's annual reports⁴ on the state of CMRS

¹ Commercial Mobile Services came to be known as the Commercial Mobile Radio Services, or "CMRS." CMRS includes a large number of terrestrial services and some mobile satellite services. See 47 C.F.R. § 20.9(10).

² The Omnibus Budget Reconciliation Act of 1993, Pub. L. No. 103-66, Title VI, § 6002(b), amending the Communications Act of 1934 and codified at 47 U.S.C. § 332(c). As in the past, this report bases its analysis on a consumer-oriented view of wireless services by focusing on specific product categories, regardless of their regulatory classification. In some cases, this includes an analysis of offerings outside the umbrella of "services" specifically designated by the Commission as CMRS. However, because providers of these other services can compete with CMRS providers, the Commission believes that it is important to consider them in the analysis. As the Commission said, paraphrasing the Department of Justice/Federal Trade Commission guidelines on merger review, "When one product is a reasonable substitute for the other in the eyes of consumers, it is to be included in the relevant product market even though the products themselves are not identical." Application of Echostar Communications Corporation, General Motors Corporation, and Hughes Electronics Corporation (Transferors) and Echostar Communications Corporation (Transferee), *Hearing Designation Order*, 17 FCC Rcd 20559, 20606 (2002).

³ 47 U.S.C. § 332(c)(1)(C).

⁴ See Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, *First Report*, 10 FCC Rcd 8844 (1995) ("*First Report*"); Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, *Second Report*, 12 FCC Rcd 11266 (1997) ("*Second Report*"); Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, *Third Report*, 13 FCC Rcd 19746 (1998) ("*Third Report*"); Implementation of

competition.⁵

7. The statute requiring the annual report on CMRS competition states,

The Commission shall review competitive market conditions with respect to commercial mobile services and shall include in its annual report an analysis of those conditions. Such analysis shall include an identification of the number of competitors in various commercial mobile services, an analysis of whether or not there is effective competition, an analysis of whether any of such competitors have a dominant share of the market for such services, and a statement of whether additional providers or classes of providers in those services would be likely to enhance competition.⁶

8. With the *Ninth Report*, we continue to comply with each of the four statutory requirements for analyzing competitive market conditions with respect to commercial mobile services. As in previous reports, we base our analysis of competitive market conditions on a range of standard indicators commonly used for the assessment of effective competition. We also enhance our analysis by reorganizing the presentation of the various indicators to conform to a framework that groups such indicators into four distinct categories (A) Market Structure, (B) Carrier Conduct, (C) Consumer Behavior, and (D) Market Performance. Use of this framework has the advantage of providing a systematic approach to addressing the four statutory requirements. Thus, Section III identifies the number of competitors in various commercial mobile services as part of the analysis of market structure. Moreover, as in previous reports, this report addresses the issue of whether any competitor has a dominant share of the market based on a comprehensive analysis of market structure, carrier conduct, consumer behavior and market performance. With respect to market structure, Section III.C provides concentration measures based on subscriber market shares for particular geographic areas, and Section III.E assesses entry conditions. In addition, Sections IV, V and VI determine whether, in light of the structural conditions examined in Section III, any single carrier has the ability to act anti-competitively by examining, among other things, various indicators of price- and non-price rivalry, consumer switching behavior and pricing trends.

Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, *Fourth Report*, 14 FCC Rcd 10145 (1999) ("*Fourth Report*"); Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, *Fifth Report*, 15 FCC Rcd 17660 (2000) ("*Fifth Report*"); Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, *Sixth Report*, 16 FCC Rcd 13350 (2001) ("*Sixth Report*"); Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, *Seventh Report*, 17 FCC Rcd 12985 (2002) ("*Seventh Report*"); Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, *Eighth Report*, 18 FCC Rcd 14783, ¶ 124 (2003) ("*Eighth Report*"). The reports can also be found on the FCC's website at <<http://wireless.fcc.gov/cmrs-crforum.html>>.

⁵ This report, like the others before it, discusses CMRS as a whole because Congress called on the Commission to report on "competitive market conditions with respect to commercial mobile services." 47 U.S.C. § 332(c)(1)(C). Any individual proceeding in which the Commission defines relevant product and geographic markets, such as an application for approval of a license transfer, may present facts pointing to narrower or broader markets than any used, suggested, or implied in this report.

⁶ 47 U.S.C. § 332 (c)(1)(C).

9. Section II.E presents our assessment of whether or not there is effective competition, drawing on the more detailed and comprehensive analysis of the various indicators of competitive market conditions in the body of the report. Section II.E also addresses the final statutory requirement to provide a statement of whether additional providers would likely enhance competition.

B. Sources of Information

10. Since the release of the *Eighth Report*, the Commission has expanded its efforts to improve the quality and granularity of the data used to examine competition in the CMRS industry. In March 2004, the Commission released a Notice of Inquiry ("*Ninth CMRS NOI*") seeking data and information on the status of competition in the CMRS industry.⁷ The Commission requested data based on several metrics, including subscribership, penetration rates, usage, average revenue per unit ("ARPU"), pricing, quality of service, and service availability.⁸ For each of these metrics, it requested data on whether they varied between urban and rural areas as well as among different demographic groups.⁹ In order to enhance our analysis of CMRS service availability and competition, the Commission asked service providers to submit their coverage maps in an electronic, mapable format and to distinguish between the areas where they offer coverage to subscribers and the areas where they market service to new customers.¹⁰ The *Ninth CMRS NOI* also requested comment on how the Commission should define "rural" for purposes of its analysis of CMRS competition.¹¹ Furthermore, the *Ninth CMRS NOI* asked for information on wireless-wireline competition, mobile telecommunications costs, mobile telephone service resellers, mobile data service availability, and satellite providers.¹²

11. Eight parties submitted comments or reply comments in response to the *Ninth CMRS NOI*.¹³ Three commenters stated that the CMRS marketplace is competitive and cited the data presented in

⁷ Implementation of Section 6002(B) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, WT Docket No. 04-111, *Notice of Inquiry*, 19 FCC Rcd 5608 (2004) ("*Ninth CMRS NOI*"). See also, Implementation of Section 6002(B) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, WT Docket No. 02-379, *Notice of Inquiry*, 17 FCC Rcd 24923 (2002) ("*Eighth CMRS NOI*").

⁸ *Ninth CMRS NOI*, at 5610.

⁹ *Id.*

¹⁰ *Id.*, at 5615-5616.

¹¹ *Id.* See also, Facilitating the Provision of Spectrum-Based Services to Rural Areas and Promoting Opportunities for Rural Telephone Companies To Provide Spectrum-Based Services, WT Docket No. 02-381, *Notice of Inquiry*, 17 FCC Rcd 25554 (2002) ("*Rural NOI*") (Commission sought comment on whether and how it could modify its policies to promote the further development and deployment of spectrum-based services in rural areas).

¹² *Ninth CMRS NOI*, at 5616, 5617, 5627, and 5631.

¹³ See Appendix C for a list of parties that filed comments in response to the *Ninth CMRS NOI*.

previous reports as evidence of that assertion.¹⁴ Some commenters also noted that the publicly-available data on the industry that is included in our reports is sufficient for analyzing CMRS competition.¹⁵ Furthermore, some commenters addressed the issue of the extent of competition in rural areas, and offered suggestions on how to define rural for purposes of this report.¹⁶ Such statements and suggestions have been integrated into this report. Other commenters provided input on the extent to which Mobile Virtual Network Operators ("MVNOs") and resellers compete in the CMRS industry.¹⁷ On the other hand, many of the questions posed in the *Ninth CMRS NOI* were not directly addressed in the comments. For example, the Commission received from commenters little new data on subscribership, ARPU, usage, churn, or pricing on a national or sub-national level, or broken down by demographic groups or urban/rural areas. In addition, service providers did not submit maps of their coverage areas or distinguish between areas where they provide coverage and areas where they market service.

12. Prior to the *Seventh Report*, the Commission based its analysis of competition in the CMRS industry solely on numerous publicly-available sources of data on the industry. These sources included: company filings with the Securities and Exchange Commission ("SEC"), data compiled and released by trade associations and by other government agencies, reports by securities analysts and other research companies and consultants, company news releases and web sites, newspaper and periodical articles, and the Commission's Universal Licensing System ("ULS") database. In the *Seventh Report*, the Commission added two new sources of information: the Numbering Resource Utilization / Forecast ("NRUF") database, described below, and information submitted at a Public Forum held at the Commission.¹⁸ Nevertheless, we continue to rely primarily on the aforementioned publicly-available sources and believe that they, when taken together, allow us to analyze the extent of competition in the industry on a nationwide basis. Because many of these publicly-available sources report national averages that reflect trends in the nation as a whole or in urban markets, they may provide limited insight into the extent of competition in particular geographic markets, including markets located in rural areas.

¹⁴ See Cellular Telecommunications & Internet Association, *NOI Comments*, at ii, 45 (filed Apr. 26, 2004) ("*CTIA Comments*"); Rural Cellular Association, *NOI Comments*, at 3 (filed Apr. 26, 2004) ("*RCA Comments*"); Sprint Corporation, *NOI Reply Comments*, at 5-6 (filed May 10, 2004) ("*Sprint Reply Comments*").

¹⁵ *CTIA Comments*, at ii, 3; *Sprint Reply Comments*, at 4.

¹⁶ Blooston, Mordkofsky, Dickens, Duffy & Prendergast, *NOI Comments*, at 7 (filed Apr. 26, 2004) ("*Blooston Carrier Comments*"); RCA Comments at 5-6; Rural Telecommunications Group, Inc., *NOI Reply Comments*, at 2-3 (filed May 10, 2004) ("*RTG Reply Comments*").

¹⁷ *CTIA Comments*, at 21-2; Virgin Mobile USA, LLC, *NOI Comments*, at 3 (filed Apr. 26, 2004) ("*Virgin Mobile Comments*").

¹⁸ The Public Forum was held in order to examine ways in which to better gather and analyze data for its reports, in particular data regarding the development of competition in rural and underserved areas. See Wireless Telecommunications Bureau Announces Agenda and Speakers For Public Forum For The 7th Annual Commercial Mobile Radio Services Competition Report, *Public Notice*, DA 02-422 (rel. Feb. 25, 2002). See FCC, *Commercial Mobile Radio Services (CMRS) Competition Report Public Forum*, <<http://wireless.fcc.gov/cmrs-crforum.html>> for access to participants' presentations and forum transcript. The direct link to the forum transcript is <<http://wireless.fcc.gov/services/cmrs/presentations/020228.pdf>> ("*Transcript*"). Forum participants not only provided additional data, including data on the average price of mobile telephone service in rural areas, but also presented suggestions on how to analyze data more effectively. Research organizations and agencies offered insight into the methodologies they use to gather and analyze data, and the wireless carriers offered anecdotes on the competitive pressures that their companies face. The Commission incorporated these data, suggestions, and insights into the *Seventh Report*.

However, the NRUF data and the information submitted in response to the *Ninth CMRS NOI* have enabled us to conduct a more granular analysis of competition on a regional level and also for the purposes of comparing urban and rural areas.

13. In order to further uphold the integrity of our data on CMRS competition, we include, in many places, multiple data sources to report on the same metric or depict the same trend. For example, this report and previous reports have included data from three separate sources – the U.S. Department of Commerce Bureau of Labor Statistics (“BLS”); economic research and consulting firm, Econ One; and the Cellular Telecommunications and Internet Association (“CTIA”) – on the average price of mobile telephone service.¹⁹ In addition to using multiple sources for many metrics, we also emphasize that some of the sources upon which we rely, particularly SEC filings, are required by law to be accurate, and are scrutinized by independent third parties. The CTIA metrics used in the report are compiled and aggregated by an independent third party in a manner that protects carrier confidentiality, provides an incentive for carrier participation, and maintains the integrity of the results.²⁰ Furthermore, other carrier-reported data included in the report, such as coverage maps, are subject to contractual obligations with customers. Because all carrier-reported data is compiled by the carriers themselves and typically released in the aggregate to protect confidentiality, we are unable to have in-depth knowledge of the minutia of such data. However, we believe it is appropriate to use these sources in our analysis of CMRS competition for the reasons stated above.

14. As mentioned above, the *Seventh Report* integrated a new source of data collected through an FCC order, the NRUF database.²¹ The NRUF data tracks phone number usage by all telecommunications carriers, including wireless carriers, in the United States. All mobile wireless carriers must report to the FCC the quantity of their phone numbers that have been assigned to end users, thereby permitting the Commission to make an accurate estimate of the total number of mobile subscribers. As in the *Seventh Report*, we continue to use the NRUF data to determine the total number of mobile telephone subscribers and paging subscribers.²² In addition, because we collect NRUF data on a small, rate center area basis,²³ we can use this information to estimate mobile telephone subscribership levels and penetration rates on a regional basis in addition to a national basis. In the *Seventh Report*, the Commission therefore began reporting mobile telephone penetration rates on an Economic Area (“EA”) basis and continues to report them in this manner in this report.²⁴ Finally, beginning with this *Ninth Report*, we use NRUF data for the

¹⁹ See Section VI.A.1, Pricing Trends, *infra*.

²⁰ See CTIA, *Wireless Industry Indices: Semi-Annual Data Survey Results* (results through December 2003) (“Dec 2003 CTIA Survey”). See note 466, *infra*, for a discussion of data reported by CTIA.

²¹ See Section VI.B.1, Subscriber Growth, *infra*, for a further discussion of NRUF data. Carriers submit the data to NeuStar, Inc., who consolidate the data into a database and supply it to the Commission upon request.

²² See *Seventh Report*, at 13005, 13049.

²³ Rate centers are small geographic areas used by local exchange carriers for a variety of reasons, including the determination of toll rates. See Harry Newton, *NEWTON’S TELECOM DICTIONARY: 16TH EXPANDED & UPDATED EDITION*, CMP Books, July 2000, at 732. Urban rate centers are generally smaller than rural rate centers. The smallest rate centers are a few square miles in size, while some rural rate centers are hundreds of square miles in size. Rate centers are generally smaller than counties: there are roughly 18,000 rate centers in the United States, compared to 3,000 counties.

²⁴ See Section VI.B.4, Sub-National Penetration Rates, *infra*. EAs, which are defined by the Department of Commerce’s Bureau of Economic Analysis, are particularly well-suited for comparing regional mobile telephony

first time to measure market concentration on an EA basis. In particular, the subscriber market shares we use to calculate the Herfindahl-Hirschman Index ("HHI") for EAs are based on NRUF data.²⁵ However, although we are using EAs to calculate both sub-national penetration levels and HHIs for the purposes of this report, this does not mean that we find the EA to be a relevant geographic market for other purposes.

15. One of the most important metrics that the Commission has tracked since 1995 is the number of facilities-based mobile telephone carriers providing service in a particular geographic area.²⁶ To track service launches by broadband Personal Communications Services ("broadband PCS" or "PCS") and Specialized Mobile Radio ("SMR") operators, the Commission has analyzed publicly-available information released by the operators, such as news releases, filings with the SEC, coverage maps available on operators' Internet sites, and filings with the Commission. The Commission has based its analysis of cellular coverage on cellular licensees' service area boundary maps, which are filed with the Commission. The Commission began tracking service launches on a BTA-by-BTA²⁷ basis in 1995, but switched to the more detailed, county-by-county basis in the *Fifth Report* in an effort to improve accuracy and significantly reduce the level of overcounting.²⁸ It has derived from these data the number of competitors operating in every U.S. county and hence the percentage of the U.S. population living in areas with a certain number of competitors.²⁹ These data have also been used to derive the percentage of the U.S. population living in counties with digital coverage. As mentioned in previous reports, there are several important caveats to note when considering the data. First, to be considered as "covering" a county, an operator need only be offering any service in a portion of that county. Second, multiple operators shown as covering the same county are not necessarily providing service to the same portion of

penetration rates for two reasons. First, the defining aspect of mobile telephony is, of course, mobility. Each EA is made up of one or more economic nodes and the surrounding areas that are economically related to the node. The main factor used in determining the economic relationship between the two areas is commuting patterns, so that each EA includes, as far as possible, the place of work and the place of residence of its labor force. Thus, an EA may capture the market where the average person would shop for and purchase his or her mobile phone – near home, near the workplace, and all of the places in between. Second, wireless carriers have considerable discretion in how they assign telephone numbers across the rate centers in their operating areas. In other words, a mobile telephone subscriber can be assigned a phone number associated with a rate center that is a significant distance away from the subscriber's place of residence (but generally still in the same EA). See *Seventh Report*, at 13005.

²⁵ See Section III.C.2, Concentration Measures for Mobile Telephony Services, *infra*.

²⁶ See Section III.C.1, Number of Mobile Telephony Competitors, *infra*.

²⁷ Basic Trading Areas ("BTAs") are Material Copyright (c) 1992 Rand McNally & Company. Rights granted pursuant to a license from Rand McNally & Company through an agreement with the Federal Communications Commission. BTAs are geographic areas drawn based on the counties in which residents of a given BTA make the bulk of their shopping goods purchases. Rand McNally's BTA specification contains 487 geographic areas covering the 50 states and the District of Columbia. For its spectrum auctions, the Commission added additional BTA-like areas for: American Samoa; Guam; Northern Mariana Islands; San Juan, Puerto Rico; Mayagüez/Aguadilla-Ponce, Puerto Rico; and the U.S. Virgin Islands.

²⁸ BTAs can be sub-divided into counties. The United States is made up of approximately 3,200 counties versus 493 BTAs.

²⁹ For a complete list of cellular and PCS licenses on a county-by-county basis, see FCC Wireless Telecommunications Bureau, *Broadband PCS Data*, <<http://wireless.fcc.gov/services/broadbandpcs/data/>>; FCC Wireless Telecommunications Bureau, *Cellular Services Data*, <<http://wireless.fcc.gov/services/cellular/data/>>.

that county. Third, the figures for POPs³⁰ and land area in this analysis include all of the POPs and every square mile in a county considered to have coverage. Therefore, our analysis overstates to some unknown and unavoidable degree the total coverage in terms of both geographic areas and population covered. On the other hand, we believe our analysis to be the most accurate in the industry today given the coverage data that is publicly available.

16. Another more general limitation of the Commission's analysis of the number of facilities-based mobile telephone carriers providing service in a particular geographic area is that it does not account for differences in the market shares of mobile telephone carriers. As indicated above, however, the *Ninth Report* supplements the analysis of the number of mobile telephone carriers with the measurement of concentration using HHIs calculated based on subscriber market shares for EAs. The value of HHI reflects both the number of market competitors and the distribution of their market shares.

C. Structure of Report

17. As noted above, we have modified the structure of the *Ninth Report* to conform to a framework that groups the indicators of competitive market conditions into four distinct categories (A) Market Structure, (B) Carrier Conduct, (C) Consumer Behavior, and (D) Market Performance. The section on market performance evaluates the outcomes of competitive conditions in the CMRS industry from the consumer's point of view, focusing on the benefits to consumers of competition such as lower prices, higher quality, greater variety, and more rapid innovation. In contrast, the sections on market structure, carrier conduct, and consumer behavior examine the various structural and behavioral determinants of such market outcomes.

18. In using this framework to analyze competitive market conditions with respect to commercial mobile radio services, we have integrated the discussion and analysis of mobile voice and mobile data services within each of the four categories of indicators. As stated in previous reports, mobile voice and mobile data services are no longer clearly delineated in the marketplace.³¹ Many mobile voice operators also offer mobile data services using the same spectrum, network facilities, and customer equipment. Furthermore, many U.S. mobile carriers have integrated the marketing of mobile voice and data services. For these reasons, we find it reasonable to analyze competitive conditions with respect to these services together.³² As in previous reports, we continue to identify, and to distinguish from such integrated mobile carriers, mobile data providers that offer only mobile data services, instead of both voice and data services, including those providers that offer such data-only services on networks distinct from those traditionally used to provide mobile voice. However, we analyze competitive conditions with respect to the services provided by integrated mobile carriers and data-only providers together, rather than treating mobile data services and data-only service providers in a separate section of the report.

³⁰ POPs is an industry term referring to population, usually the number of people covered by a given wireless license or footprint. One "POP" equals one person.

³¹ See *Eighth Report*, at 14792.

³² Although we integrate the analysis of mobile voice and data services for the reasons indicated here, below we define separate product markets for mobile voice services and mobile data services. See Section III.A, Services and Product Market Definition, *infra*. Accordingly, our integration of the analysis of mobile voice and data services in the context of this report should not be taken as an indication that the Commission will consider mobile voice and data services as belonging in the same product market in a different context.

19. As in previous reports, the *Ninth Report* includes an analysis of wireless-to-wireline competition. However, since such “intermodal” competition is distinct from “intra-modal” competition among the various wireless carriers, we have placed our analysis of wireless-to-wireline competition in a separate section on intermodal issues (Section VII), following the sections on market structure, carrier conduct, consumer behavior and market performance within the CMRS industry. In addition to the analysis of wireless-to-wireline competition, Section VII also provides an analysis of Wireless Fidelity, or Wi-Fi. Although both CMRS and Wi-Fi are wireless services, Wi-Fi relies on a different wireless technology and spectrum model than CMRS, and it has the potential to act as a substitute as well as a complement to data services offered over mobile telephone networks.

D. Industry Development

20. During 2003, the CMRS industry continued to experience increased service availability, intense price competition, innovation, and a wider variety of service offerings.³³ The mobile telephony sector of CMRS has shown significant growth, and mobile data services have begun to play a more significant role in the CMRS industry. In the 12 months ending December 2003, the mobile telephony sector generated over \$88 billion in revenues,³⁴ increased subscribership from 141.8 million to 160.6 million,³⁵ and produced a nationwide penetration rate of roughly 54 percent.³⁶ For some mobile telephone operators, data services now make up 2 to 5 percent of revenues.³⁷

21. To date, 276 million people, or 97 percent of the total U.S. population, live in counties with access to three or more different operators (cellular, broadband PCS, and/or digital SMR providers) offering mobile telephone service, a slight increase from what the Commission found in the *Eighth Report*.³⁸ Almost 250 million people, or 88 percent of the U.S. population, live in counties with five or more mobile telephone operators competing to offer service.³⁹ Mobile telephone carriers continued to upgrade their networks with next generation technologies that allow them to offer mobile data services at higher data transfer speeds.⁴⁰ To date, operators are offering services over these next generation networks in at least some portion of U.S. counties containing 279 million people, or 98 percent of the U.S. population.⁴¹

³³ “Increased service availability” refers to the increase in the population living in counties served by 3 or more, 4 or more, 5 or more, 6 or more, and 7 or more CMRS providers. See Section III.C.1, Number of Mobile Telephony Competitors, *infra*.

³⁴ See Appendix A, Table 1, at A-2.

³⁵ See Section VI.B.1, Subscriber Growth, *infra*.

³⁶ *Id.*

³⁷ See Section IV.B.7, Mobile Data Services and Applications, *infra*.

³⁸ See Appendix A, Table 10, at A-11.

³⁹ See Appendix A, Table 5, at A-9.

⁴⁰ See Section IV.B.1.c Technology Choices and Upgrades of Mobile Telephony Carriers, *infra*.

⁴¹ See Section IV.B.1.d, Coverage by Technology Type, *infra*.

22. Mobile telephone carriers continued to offer a variety of handset-based mobile data applications to consumers during the past year, including text messaging services (also called short messaging services, or "SMS"), multimedia messaging services ("MMS") such as photo messaging, and entertainment applications such as downloadable ring tones and games. These data services continued to grow in popularity. It is estimated that today almost 25 percent of U.S. mobile subscribers can be considered casual data users, most of whom use SMS and some of whom use picture mail, download ring tones or do simple web surfing.⁴² Mobile telephone carriers and other mobile data providers also continued to offer large mobile Internet access service packages designed for data-centered laptop and PDA users in the past year, but demand for such bulk wireless data services remained weak due to the limited coverage to date of high-speed wireless data networks and the slow speeds, relative to fixed broadband, of wireless network technologies that are widely available today.⁴³ Finally, as in the previous four years the use of paging devices continued to decline in the past year.⁴⁴

E. Status of Competition

23. An assessment of effective competition in telecommunications markets requires an analysis of various indicators of market structure, carrier conduct, consumer behavior, and market performance. This report will examine the behavioral as well as the structural characteristics of CMRS markets to determine whether there is effective competition in the CMRS marketplace.

24. The indicators and analysis that form the basis for our conclusion on the status of competition are detailed in the main body of this report. Here we highlight some of the indicators that show clear improvement in competitive conditions in the past year, beginning with indicators of market structure. In addition to the aforementioned slight increase in the percent of the total U.S. population living in counties with access to 3 or more different operators as compared with what the Commission found in the *Eighth Report*, there were somewhat larger increases in the percent of the U.S. population living in counties with access to 4 or more, 5 or more, 6 or more, and 7 or more different operators in the past year.⁴⁵ These increases not only suggest that competition is fairly robust in terms of the current number of competitors per market, but they also demonstrate that competitive entry continues to occur at the county level despite possible entry barriers.

25. In the category of carrier conduct, it is noteworthy that several mobile operators have recently introduced push-to-talk ("PTT") services to compete with Nextel's rival PTT offering, an indication of increased non-price rivalry.⁴⁶ As far as consumer behavior is concerned, the implementation of local number portability ("LNP") has lowered consumer switching costs by enabling wireless subscribers to keep their phone numbers when changing wireless providers. While to date the advent of LNP does not appear to have resulted in an increase in wireless churn, it does appear to have increased competitive pressures on CMRS carriers with regard to existing customers as evidenced by the aggressive customer retention efforts launched by carriers in anticipation of LNP.⁴⁷

⁴² See Section VI.B.1 Subscriber Growth, *infra*.

⁴³ See Section VI.B.3, Mobile Data Usage, *infra*.

⁴⁴ See Section VI.B.1, Subscriber Growth, *infra*.

⁴⁵ See Appendix A, Table 10, at A-11.

⁴⁶ See Section IV.B.6, Provision of Ancillary Services and Promotional Offers, *infra*.

⁴⁷ See Section V.B.2, Local Number Portability, *infra*.

26. With respect to market performance, the increased benefits to consumers afforded by competition are evidenced by the increase in the number of mobile subscribers noted above and also greater usage of mobile handsets not only for voice calls but also for new data applications such as text and photo messaging. Evidence on mobile pricing trends is somewhat mixed, with two different indicators of mobile pricing - revenue per minute and the cellular Consumer Price Index ("CPI") - continuing to drop, and a third indicator based on the consumption patterns of hypothetical users showing a slight increase in the cost of mobile service from 2002 to 2003.⁴⁸ Nevertheless, mobile voice pricing is far less expensive per minute in the United States than in European mobile markets.⁴⁹

27. Based on an analysis of these and other indicators detailed in the body of the report, we conclude that there is effective competition in the CMRS marketplace. Regarding rural areas specifically, we also conclude that CMRS providers are competing effectively in such areas. Moreover, while it appears that, on average, a smaller number of operators are serving rural areas than urban areas, this difference does not necessarily indicate that effective CMRS competition does not exist in rural areas.⁵⁰ On the contrary, as discussed in more detail below, *Ninth CMRS NOI* commenters provide evidence that, despite the differing structure of rural markets, effective CMRS competition does exist in rural areas.⁵¹

28. As previously mentioned, the final statutory requirement in analyzing competitive market conditions with respect to CMRS is to provide a statement of whether additional providers would likely enhance competition. By way of addressing this requirement, we reiterate that, based on information on launches by county, additional providers are still entering the mobile telephone market at the county level, including some start-ups as well as operators that have previously launched mobile telephone service in other parts of the country, and that, in doing so, these additional providers presumably are enhancing competition. In addition, one of the more recent examples of entry by a new start-up occurred in an innovative niche market rather than in relatively mature CMRS markets such as mobile telephone service. In particular, Space Data Corporation acquired narrowband PCS licenses in two FCC auctions in September 2003 and has since launched its commercial telemetry service using its patented balloon-based SkySite™ technology.⁵²

III. MOBILE TELECOMMUNICATIONS MARKET STRUCTURE

29. The analysis in this section covers two distinct aspects of mobile telecommunications market structure. The first is the current level of horizontal concentration as reflected in the number of carriers competing in the various mobile service markets and their respective market shares. The second is the

⁴⁸ See Section VI.A.1, Pricing Levels and Trends, *infra*.

⁴⁹ See Section VI.E, International Comparisons, *infra*.

⁵⁰ See Section III.F.1, Geographical Comparisons: Urban vs. Rural, *infra*; *Seventh Report*, at 13024.

⁵¹ See Section III.F.1, Geographical Comparisons: Urban vs. Rural, *infra*.

⁵² See Section III.B.3, Data-Only Providers, *infra*, Section III.E.1.b, Narrowband Spectrum, *infra*, and Section IV.B.1.e, Data-Only Networks and Technology Deployment, *infra*.

ease or difficulty of entry into the various mobile service markets, with particular emphasis on the way spectrum allocation and availability affect entry conditions and barriers to entry.

30. As background to the discussion of horizontal concentration and entry conditions, Sections III.A and III.B provide an overview of the various types of CMRS services and service providers. Following the analysis of the current level of horizontal concentration in Section III.C, Section III.D examines recent or impending transactions that affect, or have the potential to affect, the level of horizontal concentration. Section III.E examines entry conditions. The final section, III.F, addresses structural differences between rural and non-rural mobile telecommunications markets in the United States.

A. Services and Product Market Definition

31. Since CMRS encompasses a variety of terrestrial and satellite services, an important initial step in analyzing the structure of the mobile telecommunications market is to define the relevant product market for each of these services. The basic economic principle for defining the scope of the relevant product market is to include two mobile services in the same product market if they are essentially interchangeable from the perspective of most consumers – that is, if consumers view them as close substitutes. For the purposes of this report, relatively narrow product market definitions will be used, with a separate product market identified for each of the following services: interconnected mobile voice; interconnected mobile data; and mobile satellite service. However, the identification of separate markets for each service in the context of this report does not preclude the possibility that, in a different context, the Commission may find that two or more of these services belong in the same product market. The Commission may also find that certain types of mobile voice or data services (for example, nationwide calling plans, paging services) constitute a separate relevant product market, or that consumer demand for bundled packages of interconnected mobile voice and mobile data services make it appropriate to define one or more separate markets for bundled mobile services.

32. This report defines the mobile telephone sector to include all operators that offer commercially available, interconnected mobile voice services. These operators provide access to the public switched telephone network (“PSTN”) via mobile communication devices employing radiowave technology to transmit calls. As discussed below, providers using cellular radiotelephone, broadband PCS, and SMR licenses dominate this sector.⁵³

33. For purposes of this report, mobile data service is considered to be the delivery of non-voice information to a mobile device. Two-way mobile data services include not only the ability to receive non-voice information on an end-user device but to send it from an end-user device to another mobile or landline device using wireless technology. The mobile data services currently available include paging, text messaging (also called short messaging service, or “SMS”), multimedia messaging services (“MMS”) such as exchanging digital photos, information alerts, entertainment applications such as ring tones and games, web browsing, e-mail, access to files stored on corporate servers, and wireless telemetry.⁵⁴

⁵³ See 47 C.F.R. §§ 22.900, 24.200, 90.601.

⁵⁴ Wireless telemetry is the use of wireless technology to monitor mobile or fixed equipment in a remote location, such as the remote monitoring of utility meters by utility and energy companies. See *Eighth Report*, at 14864-14865.

34. Although we decline to identify a separate market for paging services for the purposes of this report, as noted above this does not preclude the possibility that the Commission may find that paging services constitute a separate product market, rather than a part of the broader market for mobile data services, in a different context. Traditional paging service consists of one-way data communications sent to a mobile device that alerts the user when it arrives. The communication typically consists of a phone number for the user to call, and can also contain other text-based information. As noted in the *Eighth Report*, mobile telephone carriers also offer paging services, as most digital mobile telephone handsets include a paging component and/or Caller ID feature that allow users to view the phone number of the person who has called them.⁵⁵ However, while paging carriers have faced competition from these types of features offered by mobile telephone carriers, traditional paging devices are generally less expensive, and paging networks have a more powerful signal strength which allows them to provide better underground and in-building coverage.⁵⁶ As discussed in the *Eighth Report*, paging carriers have been responding to these competitive advantages by targeting their services at a smaller market segment consisting mainly of commercial customers such as medical and emergency personnel and large industrial companies.⁵⁷ Nevertheless, paging carrier Metrocall Holdings, Inc. ("Metrocall") argued in comments submitted in response to the *Ninth CMRS NOI* that there is no distinct product market for paging services.⁵⁸ Metrocall claimed that consumers have found paging services to be interchangeable with other CMRS services, and that CMRS customers are increasingly substituting mobile telephony services and other wireless services for traditional paging services.⁵⁹ Metrocall particularly singled out short message service ("SMS") as competing directly with paging because it is offered at relatively inexpensive rates by all the major mobile telephony carriers.

35. Any mobile satellite service ("MSS") that involves the provision of commercial mobile radio service directly to end users is by statutory definition CMRS.⁶⁰ As detailed in the *Eighth Report*, the Commission permits MSS providers in the 2 GHz,⁶¹ Big LEO,⁶² and L-Band⁶³ frequency bands to provide an ancillary terrestrial component ("ATC") to their satellite systems, provided that the MSS licensee: (1) has launched and operates its own satellite facilities; (2) provides substantial satellite

⁵⁵ See *Eighth Report*, at 14846.

⁵⁶ See *Seventh Report*, at 13051; John Sullivan, *Motorola's Exit: Death Knell Or New Dawn For Paging Market?*, WIRELESS DATA NEWS, Dec. 19, 2001.

⁵⁷ See *Eighth Report*, at 14846.

⁵⁸ See Metrocall Holdings, Inc., *NOI Comments*, at 3.

⁵⁹ *Id.*, at 3-9.

⁶⁰ 47 C.F.R. § 20.9(10). This rule section also contains an exception for "mobile satellite licensees and other entities that sell or lease space segment capacity, to the extent that it does not provide commercial radio service directly to end users." The exception permits such entities to provide space segment capacity to commercial mobile radio service providers on a non-common carrier basis, if authorized by the Commission.

⁶¹ The 2 GHz MSS band refers to the 2000-2020 MHz uplink (Earth-to-space transmissions) and 2180-2200 MHz downlink (space-to-Earth transmissions) frequencies.

⁶² The Big LEO (low-earth orbit) band MSS allocation consists of an uplink at 1610-1626.5 MHz and a downlink at 2483.5-2500 MHz and is sometimes referred to as the 1.6/2.4 GHz band.

⁶³ The L-Band has MSS allocations at 1525-1559 MHz (downlink) and 1626.5-1660.5 MHz (uplink).

service to the public; (3) provides integrated ATC; (4) observes existing satellite geographic coverage requirements; and (5) limits ATC operations only to the authorized satellite footprint.⁶⁴ The *Satellite Flexibility Order* noted that, since terrestrial CMRS and MSS ATC are expected to have different prices, coverage, product acceptance and distribution, the two services appear, at best, to be imperfect substitutes for one another that would be operating in predominately different market segments.⁶⁵ The Commission has received one application to add ATC to MSS satellite offerings, from Mobile Satellite Ventures ("MSV") in the L-Band.

B. Overview of Service Providers

1. Facilities-Based Mobile Telephony Providers

36. In the United States, there are six mobile telephone operators that analysts typically describe as nationwide: AT&T Wireless, Sprint PCS,⁶⁶ Verizon Wireless, LLC ("Verizon Wireless"),⁶⁷ T-Mobile,⁶⁸ Cingular Wireless, LLC ("Cingular Wireless" or "Cingular"),⁶⁹ and Nextel. When an operator is described as being "nationwide," it does not necessarily mean that the operator's license areas, service areas, or pricing plans cover the entire land area of the United States. The six mobile telephony carriers that analyst reports typically describe as nationwide all offer service in at least some portion of the western, midwestern, and eastern United States. In addition, each of the six national operators has networks covering at least 200 million people, while the next largest provider covers less than 60 million people.⁷⁰ In addition to the nationwide operators, there are a number of large regional players, including ALLTEL Corp. ("ALLTEL"), Western Wireless Corp. ("Western Wireless"), United States Cellular Corp. ("US Cellular"), and Dobson Communications ("Dobson").

37. Because the six nationwide mobile telephone operators as well as the large regional and numerous other smaller operators have different geographic footprints, they do not all compete head-to-head in each and every region and locality of the country. To provide an accurate count of the number of

⁶⁴ See Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz bands; Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands, *Report and Order and Notice of Proposed Rulemaking*, 18 FCC Rcd 1962, 1964 (2003) ("*Satellite Flexibility Order*").

⁶⁵ *Flexibility Order*, at 1984.

⁶⁶ Sprint PCS is a division of Sprint Corp. ("Sprint"). See Sprint Corp., SEC Form 10-K, Mar. 9, 2004, at 4. Sprint recently recombined its tracking stocks, representing its wireless and wireline divisions, into one stock. *Combination of 'FON' and 'PCS' Tracking Stocks Completed*, News Release, Sprint, Apr. 23, 2004.

⁶⁷ Verizon Wireless is a joint venture of Verizon Communications, Inc. ("Verizon") and Vodafone Group PLC ("Vodafone"). Verizon owns 55 percent of Verizon Wireless, and Vodafone owns 45 percent. See Verizon Communications, Inc., SEC Form 10-K, Mar. 20, 2002, at 10.

⁶⁸ T-Mobile USA, formerly known as VoiceStream Wireless Corp., is a wholly-owned subsidiary of Deutsche Telekom AG ("Deutsche Telekom").

⁶⁹ Cingular Wireless is a joint venture of SBC Communications, Inc. ("SBC") and BellSouth Corporation ("BellSouth"). See *Sixth Report*, at 13363-64.

⁷⁰ Colette M. Fleming *et al.*, *Wireless 411*, UBS Warburg, Equity Research, Apr. 16, 2004, at 16 ("*Wireless 411*").

competitors in the market for mobile telephony services in compliance with the statutory requirement, it is necessary as an initial step to define the scope of the geographic market more narrowly on a regional or local basis. For example, Section III.C.1 below identifies the number of mobile telephony competitors on a county-by-county basis.

2. Resale Providers

38. Resellers offer service to consumers by purchasing airtime at wholesale rates from facilities-based providers and reselling it at retail prices.⁷¹ One *Ninth CMRS NOI* commenter suggested that wireless resale may serve to increase intermodal competition by “helping non-wireless carriers compete in the local exchange and interexchange markets by permitting these carriers to offer consumers a complete ‘bundle’ of telecommunications services.”⁷² According to information provided to the FCC in its ongoing local competition and broadband data gathering program, the resale sector accounts for approximately 6 percent of all mobile telephone subscribers.⁷³

39. With the exception of TracFone Wireless Inc., which serves more than 3 million customers with prepaid offerings,⁷⁴ there appear to be few large independent resellers of wireless service.⁷⁵ In August 2003, Qwest Corporation (“Qwest”) entered into an agreement with Sprint to resell Sprint wireless services, having decided to exit the facilities-based provision of wireless service.⁷⁶ Qwest began offering these Sprint services under its own brand name in March 2004.⁷⁷ AT&T Corp, former owner of AT&T Wireless, is also planning to reenter the mobile telephone market through resale.⁷⁸

40. Two nationwide operators have partnered with third party resellers to market prepaid offerings aimed at the youth portion of the population. Virgin Mobile USA (“Virgin Mobile”), a joint venture between Sprint PCS and Richard Branson’s Virgin Group, LLC, was launched in July 2002,

⁷¹ Interconnection and Resale Obligations Pertaining to Commercial Mobile Radio Services, *First Report and Order*, 11 FCC Rcd 18455, 18457 (1996). Resellers today are often referred to as MVNOs (Mobile Virtual Network Operators). MVNOs are distinguished from “traditional” resellers by “‘brand appeal, distribution channels, and other affinities,’ including the potential ability to bundle wireless services with other non-wireless products and services, as well as the ability to provide and support value-added services.” *CTIA NOI Comments*, at 22.

⁷² *CTIA NOI Comments*, at 21.

⁷³ See Appendix A, Table 2, at A-3.

⁷⁴ *TracFone Wireless Reaches 3 Million Customers and Lowers Airtime Rates for 2004*, News Release, TracFone Wireless, Inc., Feb. 3, 2004.

⁷⁵ CTIA suggests that the existence of relatively few resellers today may be due to the growth of and intense competition between facilities-based wireless operators. See *CTIA NOI Comments*, at 20.

⁷⁶ See III.D.4, *infra*.

⁷⁷ *Id.*

⁷⁸ Shawn Yound and Almar Latour, *A New Cellphone With an Old Name*, WALL STREET JOURNAL, May 6, 2004, at B1. AT&T’s Chairman has said that AT&T would enter the wireless market once the current AT&T Wireless is absorbed by Cingular (AT&T has the right to the AT&T Wireless brand name if AT&T Wireless is acquired by Cingular). *Id.*; COMMUNICATIONS DAILY, May 19, 2004. In May 2004, AT&T reached an agreement with Sprint to offer wireless service over Sprint’s wireless network. *AT&T Reaches Wireless Deal With Sprint*, AP NEWSWIRE, May 18, 2004.

targeting its prepaid offerings at the youth market.⁷⁹ The venture has gained more than 1.75 million subscribers through March 2004.⁸⁰ Similarly, Nextel, in conjunction with an Australia-based company, is offering a prepaid service targeted at the teenage market.⁸¹ The service, under the "Boost Mobile" brand name, trialed initially in California and Nevada, and is now available in 16 states.⁸² As of Dec. 31, 2003, Nextel had about 400,000 subscribers on Boost Mobile prepaid plans.⁸³

3. Data-Only Providers

41. Non-voice services are offered by paging/messaging carriers as well as by mobile telephone carriers. Paging/messaging carriers provide these services using paging and narrowband PCS networks and spectrum, and paging/messaging devices or units. On April 9, 2004, paging carrier Metrocall submitted a transfer of control application to the Commission in conjunction with the announced merger with Arch Wireless Communications, Inc. ("Arch Wireless").⁸⁴ Other major paging carriers include SkyTel Communications, Inc., SBC Paging, and Verizon Wireless' paging business.⁸⁵

42. Apart from paging/messaging carriers, there are a few carriers that exclusively sell other types of mobile data services, instead of both mobile voice and data services, including Motient Corp. ("Motient") and Space Data Corp. ("Space Data"). Motient has specialized in selling and integrating wireless data solutions to enterprises, including wireless e-mail and other wireless Internet applications.⁸⁶ Space Data is currently providing commercial telemetry services for the energy industry in West Texas and eastern New Mexico, and in September 2004 announced that it will extend its telemetry services to the Gulf of Mexico later the same month.⁸⁷

⁷⁹ See Virgin Mobile USA, LLC, *Comments*, at 2 (filed Apr. 26, 2004) ("*Virgin Mobile Comments*"). For a detailed discussion of the venture, see *Seventh Report*, at 13026.

⁸⁰ *Virgin Mobile Comments*, at 2.

⁸¹ *Eighth Report*, at 14839.

⁸² *Eighth Report*, at 14839; Boost Mobile, *Coverage Maps* (visited May 17, 2003) <http://www.boostmobile.com/bshop_coverage_maps.html>.

⁸³ Nextel, SEC Form 10-K (filed Mar. 11, 2004), at 3.

⁸⁴ See Application for Transfer of Control of Metrocall USA, Inc. and Associated Request for Waiver of Electronic Filing Requirements in Connection with the Merger of Metrocall Holdings, Inc. and Arch Wireless, Inc., dated April 9, 2004. Since the *Eighth Report*, WebLink Wireless, Inc., another major paging/messaging company was merged into Metrocall. *Metrocall to Acquire WebLink*, Press Release, Metrocall, Nov. 19, 2003.

⁸⁵ SkyTel Communications, Inc. is a wholly owned subsidiary of MCI (formerly WorldCom) that was acquired on October 1, 1999. See *Fifth Report*, at 17720-17721. Mike Dano, *Nationwide paging down to one carrier*, RCR WIRELESS NEWS, Apr. 5, 2004, at 3+.

⁸⁶ See Brad Smith, *Early Data Models Drain Finances*, WIRELESS WEEK, Apr. 15, 2004 ("*Early Data Models Drain Finances*").

⁸⁷ *Space Data Launches New Wireless Telemetry Service in West Texas Oil and Gas Fields*, Press Release, Space Data Corporation, Apr. 14, 2004; *Space Data Launches New Wireless Telemetry Service*, Press Release, Space Data Corporation, Apr. 15, 2004; *Space Data Floats Wireless Data Network Over the Gulf*, Press Release, Space Data Corporation, Sept. 14, 2004; *Space Data Corporation Receives Patent for Airborne Constellation*, Press Release, Space Data Corporation, Feb. 2, 2004.

4. Satellite Providers

43. As of year-end 2003, a number of carriers were providing mobile satellite services ("MSS") in the United States.⁸⁸ Both Globalstar Telecommunications LTD. ("Globalstar") and Iridium Satellite LLC. ("Iridium Satellite") are using Big LEO MSS licenses to offer mobile voice and data services to a variety of mobile terminals, including hand-held terminals, and to fixed terminals. Inmarsat Ltd. ("Inmarsat") and MSV, the successor to Motient Services Inc., which had previously entered into a joint venture with Mobile Satellite Ventures (Canada) Inc. and the Canadian licensee of MSS satellite MSAT-1 (TMI Corporation), were also providing voice and data communications via satellite in the L-band at year-end 2003. The companies offer voice and data services in fixed and mobile environments. The mobile environment consists of a laptop-sized or larger terminal that can be transported from one location to another. Another company, ICO Global Communications (Holdings) Ltd., has launched one of its twelve U.K.-authorized satellites to operate in the 2 GHz MSS band, but has not yet begun commercial service.

C. Horizontal Concentration

44. The level of market concentration generally depends on both the number of competing carriers per market and the distribution of their respective market shares. Thus, market concentration can result from both a relatively small number of carriers competing in the relevant market and a relatively high degree of inequality in the distribution of market shares among incumbent carriers. In conjunction with entry conditions and the way carriers and consumers behave and interact, market concentration affects the likelihood that a single carrier unilaterally, or a small group of carriers through coordinated action, could successfully exercise market power.

45. The basic economic principle for defining the scope of the relevant geographic market is to include customers facing the choice of similar competitive alternatives in the same geographic market. Because U.S. mobile telephony carriers have different-sized geographic footprints, any individual mobile carrier does not compete with all other mobile carriers in each and every part of the country. This suggests that the relevant geographic market for mobile telephony services is narrower than the entire nation. An attempt to measure concentration in mobile telephony services at the national level would understate the actual level of market concentration because the underlying geographic market definition would be too broad. At the same time, defining the appropriate regional or local geographic market for mobile telephony services is a highly complex exercise due to various factors, including the relatively large number of licensed carriers, the variety of geographic schemes used to license different spectrum bands, the wide variation in carriers' geographic footprints, and the difficulty of collecting accurate information on the geographic coverage each mobile carrier provides in its license areas. To simplify the measurement task, we base our analysis of market concentration on uniform geographic areas that may be broader or narrower than the relevant geographic market. In particular, we estimate the number of

⁸⁸ In order to place a satellite telephony call, an "outbound" communication from an MSS mobile phone is transmitted up to the satellite, using "service link" frequencies. The satellite then retransmits the signal back down to the earth, using "feeder link" frequencies, to a gateway ground station, where the call is interconnected with terrestrial networks, such as the PSTN. The return or "inbound" communication works the exact opposite way. The communication from the terrestrial network is transmitted from the gateway earth station up to the satellite, and then retransmitted by the satellite back down to the MSS mobile telephone. In systems with inter-satellite links, the inbound and outbound communications may be transmitted through multiple satellites in order to complete the connection between the originating mobile telephone and the receiving gateway ground station.

competitors per market on a county-by-county basis, and we provide concentration measures at the level of EAs.

1. Number of Mobile Telephony Competitors

46. To track the level of competition in the mobile telephone sector, the Commission compiles a list of counties with some level of coverage by mobile telephone providers. This data is based on publicly-available sources of information released by the operators such as news releases, filings with the SEC, coverage maps available on operators' Internet sites, and information filed publicly⁸⁹ with the Commission in proceedings or with applications.⁹⁰

47. As previously discussed, there are several important caveats to note when considering these data. First, to be considered as "covering" a county, an operator need only be offering any service in a portion of that county. Second, multiple operators shown as covering the same county are not necessarily providing service to the same portion of that county. Consequently, some of the counties included in this analysis may have only a small amount of coverage from a particular provider. Third, the figures for POPs and land area in this analysis include all of the POPs and every square mile in a county considered to have coverage.⁹¹ Therefore, this analysis overstates the total coverage in terms of both geographic areas and populations covered.

48. On the other hand, this county-by-county analysis reflects a significant improvement in accuracy. In past *Reports*, the Commission provided summaries of estimated coverage by BTAs. Starting with the *Fifth Report*, the Commission decided to re-estimate and enhance these coverage maps using county boundaries in an attempt to provide a more precise picture of network deployment. Moreover, while the newer broadband PCS and digital SMR entrants have less complete networks, the original cellular licensees have extensive networks that provide almost complete coverage of the entire land mass of the continental United States.⁹² Cellular licensees were originally awarded a geographical area (CMA) as a license area, but they only retained that portion of the CMA where they had built out

⁸⁹ This data is not based on information that is subject to a protective order.

⁹⁰ The Commission has buildout rules for geographic area licenses, although they do not require operators to deploy networks such that the entire geographic area of a specific license receives coverage. For example, the construction requirements for the 30 megahertz broadband PCS licenses state that an operator's network must serve an area containing at least one-third of the license area's population within five years of the license being granted and two-thirds of the population within 10 years. See 47 C.F.R. § 24.203(a). Similarly, the construction requirements for the 10 and 15 megahertz broadband PCS licenses state that an operator must cover one-quarter of a license area's population, or provide "substantial service," within five years of being licensed. See 47 C.F.R. § 24.203(b). The details concerning exactly which geographic areas or portions of the population should be covered to meet these requirements are left to the operators. In addition, decisions about whether to increase coverage above these requirements are left to the operators. For information on the buildout requirements for cellular licenses, see 47 C.F.R. §§ 22.946, 22.947, 22.949, 22.951. For information on the buildout requirements for non-site based SMR licenses, see 47 C.F.R. §§ 90.665 and 90.685.

⁹¹ All population figures are based on the Bureau of the Census's 2000 county population.

⁹² See Appendix B, Maps 2-3, at B-3 – B-4. In overlapping cellular Service Area Boundaries (SABs) over census block groups, we found that less than one-tenth of one percent of the US lacked cellular coverage. FCC internal analysis. Wireless coverage is so pervasive, in fact, that the Wall Street Journal ran an article rating hotels on their lack of wireless service for those who desire to get away from it all. Nancy Keates and Shawn Young, *Destination: Unreachable*, WALL STREET JOURNAL, Apr. 23, 2004, at W1.

and expanded their wireless networks.⁹³

49. To date, 276 million people, or 97 percent of the total U.S. population, have three or more different operators (cellular, PCS, and/or digital SMR) offering mobile telephone service in the counties in which they live.⁹⁴ However, these counties make up only 62 percent of the total land area of the United States, reflecting the nation's uneven population distribution.⁹⁵ Roughly 250 million people, or 87 percent of the U.S. population, live in counties with five or more mobile telephone operators competing to offer service, while 216 million people, or 76 percent of the population, live in counties with six or more mobile telephone operators competing to offer service. Finally, 84 million people, or almost 30 percent of the population, can now choose from among seven or more different mobile telephone operators providing service somewhere in their counties, an increase of 16 percent from what was reported in the *Eighth Report*.⁹⁶

2. Concentration Measures for Mobile Telephony Services

50. This section reports the results of using the Herfindahl-Hirschman Index ("HHI") to measure market concentration with respect to the provision of mobile telephony services in EAs.⁹⁷ The value of HHI reflects both the number of market competitors and the distribution of their market shares. In general, the value of HHI declines as the number of firms increases and it increases with rising inequality among any given number of firms.⁹⁸

51. In principle, the market shares used to calculate HHIs can be based on various output measures, such as revenues or the number of subscribers. For reasons of data availability we have elected to calculate each mobile carrier's market share based on the number of subscribers served by each carrier. The number of subscribers served by each carrier is determined based on the Commission's

⁹³ Cellular licensees were originally awarded a geographical area (CMA) as a license area, but they only retained that portion of the CMA where they had built out and expanded their wireless networks. See Amendment of Part 22 of the Commission's Rules to Provide for the Filing and Processing of Applications for Unserved Areas in the Cellular Service and to Modify other Cellular Rules, *First Report and Order and Memorandum Opinion and Order on Reconsideration*, 6 FCC Rcd 6185, 6196-6200 (1991). Initial cellular system operators were given a five-year period during which to expand their systems within the CMAs in which they were licensees. *Id.*

⁹⁴ See Appendix A, Table 5, at A-9.

⁹⁵ *Id.* We note that the land area of these counties, 2.2 million square miles, is almost 50 percent larger than the combined land area of the 25 member countries of the recently expanded European Union (1.5 million square miles).

⁹⁶ See Appendix A, Table 10, at A-11.

⁹⁷ The HHI is calculated by summing the squares of the individual market shares of all firms competing in the relevant market. When a single firm is the sole supplier in the relevant market (a pure monopoly), the HHI attains its maximum value of 10,000 (100×100). As the structure of a market becomes progressively more atomistic, the value of HHI approaches 0.

⁹⁸ For example, if four carriers are identified as participants in the relevant product and geographic market and each carrier accounts for 25 percent of total sales, the value of HHI would be 2500 [$(25)^2 \times 4$]. If the number of carriers increases to five, each with a 20 percent market share, the value of HHI would decline to 2000 [$(20)^2 \times 5$]. On the other hand, if there are still only four carriers but the top carrier has a 40 percent market share while each of the remaining three carriers has 20 percent, the value of HHI would increase from 2500 to 2800 [$(40)^2 + (20)^2 \times 3$].

NRUF data, which track phone number usage information for the United States. The methodology used to compile NRUF data is described in Section VI.B.1 on subscriber growth. As discussed in detail there, limitations of the NRUF data can result in miscounting of subscribers in a given geographic area. In this regard, we measure the number of subscribers served by each carrier for a given EA because using EAs reduces the distortions arising from the limitations of the NRUF data.

52. In addition to the limitations of the NRUF data, the methodology used to calculate the HHIs for EAs has its own limitations. The methodology gives equal weight to a mobile carrier that reports assigned numbers in one county as it does to a carrier that reports assigned numbers in all counties, or at least more than one county, within the EA. In effect, the methodology is based on the implicit assumption that the EA is the relevant geographic market, so that each carrier with assigned numbers in the EA is competing head to head with all other carriers operating in the EA. However, to the extent that carriers have different coverage areas that do not overlap, not all carriers with assigned numbers in an EA are in fact direct competitors. The implication is that the HHIs for EAs will tend to understate systematically the actual level of market concentration because the underlying geographic market definition is overly broad. On the other hand, there may be factors that would cause the relevant geographic market to be broader. For these reasons, we emphasize that, in using the EA to calculate market shares for the purposes of this report, we are not concluding that the EA is the relevant geographic market for other purposes.⁹⁹

53. Based on NRUF data as of December 2003, the average value of the HHIs weighted by EA population is 2151, and the median value is about 2360.¹⁰⁰ The values of HHIs for individual EAs range from a low of 1325 in EA 107 (covering parts of Wisconsin, Iowa and Minnesota, including the Twin Cities) to a high of 7155 in EA 121 (covering parts of Nebraska and Colorado). Thus, the values of the weighted average HHI and also the HHIs in more than half of all EAs are lower than 2500, which would be the value of HHI for a hypothetical market in which there are four carriers with equal market shares.

54. As a benchmark for examining the EAs with relatively high HHIs, we note that the value of HHI in a market that is equally divided among three competitors is approximately 3333. However, there are six or more competitors in all of the EAs with HHIs in excess of 3300, and the vast majority of the EAs in this category have in excess of ten competitors operating in at least some area within the EA. This suggests that the high values of HHI in these EAs are generally due not to the number of competitors, but rather to the limited effect of competitive entry to date in eroding the market shares of one or both carriers holding the two original cellular licenses.

55. In interpreting these HHIs, it is worth noting that the economic literature does not provide a theoretical or empirical basis for the existence of any critical threshold level of concentration above which adverse competitive effects are likely.¹⁰¹ In addition, the specific technological and economic

⁹⁹ In other contexts, such as the Commission's review of license transfers and assignments, the relevant geographic market for calculating HHIs may be greater or less than an EA.

¹⁰⁰ See Appendix A, Table 3, at A-4. The simple mean (not weighted by population) is 2730.

¹⁰¹ Barry C. Harris and David D. Smith, *The Merger Guidelines Vs. Economics: A Survey of Economic Studies*, Perspectives on Fundamental Antitrust Theory, American Bar Association, Section of Antitrust Law, July 2001, at 10-12. This includes the 1800 HHI level used in the *DOJ/FTC Guidelines* to identify markets that are considered to be "highly concentrated." See U.S. Department of Justice and the Federal Trade Commission, Horizontal Merger Guidelines, 57 Fed. Reg. 41557 (Apr. 2, 1992, as revised Apr. 8, 1997), at §1.51 ("*DOJ/FTC Guidelines*").

characteristics of an industry are important determinants of the level of market concentration. Of particular importance is the relationship between economies of scale and the potential size of the market. In industries where the scale of output at which a firm can fully exploit scale economies (the minimum efficient scale) is large relative to potential demand, there will be room in the market for only a small number of firms operating at the lowest possible cost. In theory, therefore, market concentration in such industries will tend to be high relative to industries characterized by greater potential demand or smaller minimum efficient scale.

56. In light of the impact of technological and economic factors in determining the level of market concentration, it is noteworthy that the estimated values of HHIs for EAs tend to increase as the EA population declines. In other words, consistent with the theoretical considerations noted above, market concentration tends to be higher in EAs with a smaller potential subscriber base. For example, the EA with the highest HHI has the smallest population, and the EA with the second highest HHI (EA 142, covering parts of Nebraska and Wyoming) has the third smallest population.

57. However, some EAs are clear exceptions to this pattern. In particular, there are a number of EAs with mid-sized or relatively large populations that also have relatively high HHIs. Such apparent discrepancies may arise partly because the EAs also vary with regard to other important determinants of market demand and cost besides total population, including factors such as the age distribution of the population, per capita income, population density, urbanization, and the size and composition of the business sector.¹⁰² Absent a more systematic analysis of the possible relationship between these explanatory factors and market concentration, we cannot make a determination of the extent to which market concentration in any given EA is explained by potential market demand and cost considerations.

3. International Comparison of Mobile Market Concentration

58. Concentration in mobile markets abroad provides another benchmark against which to evaluate U.S. mobile market concentration. This section compares the structure of mobile telephony markets in the United States and selected countries with regard to the number of market competitors and concentration measures calculated using HHIs. We note that international differences in mobile market concentration may reflect a variety of factors, including differences in the regulatory environment.

59. One comparison of mobile telephone markets in 46 countries indicates that the number of mobile market competitors in the fourth quarter of 2003 was higher in the United States than in any of the other countries.¹⁰³ In particular, the United States is listed as having "6+" players, whereas the only other countries with as many as six players are Hong Kong and Taiwan. Several other countries, including the United Kingdom, the Netherlands, and Malaysia, are listed as having five players. The vast majority of Western European countries and also comparable Asian-Pacific countries such as Japan, South Korea, and Australia are shown as having only three or four mobile players as of the end of 2003. However, these data on the number of mobile players per market are not strictly comparable since all Western European countries and most of the Asian countries identified above have licensed mobile

¹⁰² The average cost of serving a given market tends to decline with higher population density and urbanization because high concentrations of subscribers make it easier for operators to provide adequate coverage with less infrastructure deployment. See Eugene C. Signorini, *Wireless Coverage in the United States: Leaving a Lot to Be Desired*, THE YANKEE GROUP REPORT, Vol. 1, No. 11, Aug. 2000, at 8.

¹⁰³ Michel Morin and Linda Mutschler, *Global Wireless Matrix 4Q03*, Merrill Lynch, Global Securities Research, Mar. 19, 2004, at 2 ("*Global Wireless Matrix 4Q03*").

carriers on a nationwide basis rather than by smaller geographic regions. As detailed above, the number of mobile competitors per market in the United States varies by region, ranging from as many as seven or more in some areas to fewer than four competitors in some other areas. Nevertheless, as previously mentioned 97 percent of the total U.S. population live in counties with a minimum of three different mobile operators, the same as the maximum number of national mobile carriers in Japan, South Korea, and most of the smaller Western European markets.

60. Since European regulators awarded nationwide licenses for second-generation GSM and third-generation services, national boundaries are the relevant geographic market for measuring concentration in European mobile markets. For purposes of comparison, we computed HHIs based on subscriber shares as of the fourth quarter of 2003 for the following seven countries: Finland, France, Germany, Italy, the Netherlands, Spain and the United Kingdom.¹⁰⁴ The lowest HHI values are found in the United Kingdom (2481) and the Netherlands (2538). Mobile subscribers in the United Kingdom are relatively evenly divided among the four GSM operators, and a fifth operator, a 3G start-up, launched service in 2003.¹⁰⁵ The Netherlands, with five GSM operators, is the only European country to have awarded more than four GSM licenses. The values of HHI in the remaining countries range from a low of 3375 in Germany to a high of 4122 in Finland. The relatively high values of HHI in this group of countries reflect two factors. One is the small number of competitors per market, with four carriers in Germany and Italy and only three carriers in the remaining countries. Second, each market tends to be dominated by the top two competitors, which have a combined market share ranging from 78 percent in Spain to 84 percent in Finland and France.¹⁰⁶

61. Recalling that for EAs in the United States the average value of the HHIs weighted by EA population is 2151 and that the median value is about 2360, it is evident that concentration is somewhat higher in the two least concentrated European mobile markets (the United Kingdom and the Netherlands) than in the U.S. mobile market on average. If we take the top 25 percent of EAs by HHI values, we find that the European mobile markets with higher concentration levels (in other words, with HHIs ranging from 3375 to 4122) would fall within this top 25 percent. At the same time, there are 22 EAs with higher mobile market concentration levels than Finland, the European country with the highest mobile market HHI among the European countries included in this comparison.

D. Consolidation and Exit

62. Consolidation and exit of service providers, whether through secondary market transactions or bankruptcy, may affect the structure of the mobile telecommunications market. A reduction in the

¹⁰⁴ The subscriber shares used to calculate HHIs for European mobile markets were taken from *Global Wireless Matrix 4Q03*, at 50-52, 61, 67, 77, and 85.

¹⁰⁵ The HHI calculation for the United Kingdom (UK) is based on the assumption that all five UK operators had nationwide coverage at the end of 2003. However, having launched service in March 2003, 3G start-up Hutchison initially provided urban and main artery coverage throughout the country, and as of the first quarter of 2004 its coverage was approximately 70 percent of the population. See Atsushi Umino, *Developments of Third-Generation Mobile Services in the OECD*, OECD, Mar. 2004, at 38 ("*Developments of Third-Generation Mobile Services in the OECD*"). Since Hutchison did not have nationwide coverage as of December 2003, the HHI of 2481 somewhat understates mobile market concentration in the United Kingdom at that time. If Hutchison's relatively negligible market share (0.4 percent) as of the end of 2003 is ignored, the value of HHI based on the assumption that there are four nationwide operators in the UK is 2502.

¹⁰⁶ *Global Wireless Matrix 4Q03*, at 2.

number of competing service providers due to consolidation or exit may increase the market power of any given service provider, which in turn could lead to higher prices, fewer services, and/or less innovation. However, consolidation does not always result in a negative impact on consumers. Consolidation in the mobile telecommunications market may enable carriers to achieve certain economies of scale and increased efficiencies compared to smaller operators. If the cost savings generated by consolidation encourage the newly enlarged carrier to compete more aggressively, consolidation could result in lower prices and new and innovative services for consumers.¹⁰⁷ Moreover, it is unlikely that competitive harm will result from consolidation among service providers licensed to operate in separate geographic markets.

63. Among the policies potentially affecting consolidation in this market, the Commission eliminated (effective January 1, 2003) a rule limiting the amount of spectrum a CMRS licensee could own or control in a given licensed area.¹⁰⁸ Until recently, the Commission had retained the cellular cross-interest rule in Rural Service Areas ("RSAs"), at the same time creating a waiver process in recognition that there may be RSAs in which such cross interests would not create a significant likelihood of substantial competitive harm.¹⁰⁹ On July 8, 2004, the Commission also eliminated the cellular cross-interest rule then applicable only in RSAs and transitioned to case-by-case competitive review for all applications related to transactions involving cellular licenses.¹¹⁰

64. Since the end of 1999, carriers have been building nationwide footprints¹¹¹ through various forms of transactions.¹¹² One of the driving forces behind many of these transactions has been the desire of large regional carriers to enhance their ability to compete with existing nationwide operators that offer attractive nationwide pricing plans.¹¹³ Also, as the Commission has previously concluded, operators with larger footprints can achieve certain economies of scale and increased efficiencies compared to operators with smaller footprints.¹¹⁴ More recently, national operators have sought to fill in gaps in their coverage areas,¹¹⁵ as well as to increase the capacity of their existing networks. Since the writing of the *Eighth*

¹⁰⁷ See Jonathan B. Baker, *Developments in Antitrust Economics*, JOURNAL OF ECONOMIC PERSPECTIVES, Vol. 13, No. 1, Winter 1999, at 182.

¹⁰⁸ *Spectrum Aggregation R&O*, 16 FCC Rcd at 22693, ¶ 49.

¹⁰⁹ *Spectrum Cap Order*, at 22708-22710. See, also, *Rural NOI*, at 25561.

¹¹⁰ *FCC Adopts Measures to Increase Rural Investment and Facilitate Deployment of Spectrum-Based Services in Rural Areas*, News Release, Federal Communications Commission, Jul. 8, 2004 ("Rural Order PN")

¹¹¹ Generally, "footprint" is an industry term of art referring to the total geographic area in which a wireless provider offers service or is licensed to offer service.

¹¹² The Commission must consent to the transfer of control or assignment of all spectrum licenses used to provide wireless telecommunications services. 47 C.F.R. § 1.948.

¹¹³ See *Fifth Report*, at 17699 (For a complete discussion of the motivations for this phenomenon, see *Fourth Report*, at 10159-10160).

¹¹⁴ See *Seventh Report*, at 12997. One study found bigger companies get better equipment prices because of their size. Shawn Young, *As Wireless Firms Grow, So Can Costs*, WALL STREET JOURNAL, Apr. 29, 2004, at B4. However, the study also found that the cost of signing up new customers increases as wireless companies get bigger.

¹¹⁵ For a more complete discussion of the motivations for this phenomenon, see *Fourth Report*, at 10159-10160.

Report, a number of transactions between market participants have been announced. We discuss the transactions involving the largest impact, either through the exchange of subscribers or spectrum licenses, on the structure of the market below. In addition, we discuss some of the carriers that have declared bankruptcy and/or announced other restructuring plans during the past year.

1. Sales and Swaps

65. *Cingular / AT&T Wireless* – On February 17, 2004, Cingular Wireless announced an agreement to acquire AT&T Wireless for \$41 billion in cash.¹¹⁶ According to the companies, the combined entity would have 46 million subscribers, surpassing Verizon Wireless as the largest wireless operator, with coverage in 97 of the top 100 markets and combined 2003 revenues exceeding \$32 billion.¹¹⁷ The companies, which are both committed to GSM technology, claim that the combined entity would generate more than \$1 billion in operating and capital expenditure savings in 2006, and in excess of \$2 billion in annual savings beginning in 2007.¹¹⁸ The companies predict that the acquisition, which requires regulatory approval, will be completed “as soon as late 2004.”¹¹⁹

66. *Cingular / Nextwave Telecom* – On August 5, 2003, Cingular Wireless and NextWave Telecom announced an agreement for Cingular to purchase spectrum from NextWave in 34 markets for \$1.4 billion.¹²⁰ The licenses, which cover approximately 83 million people, are primarily in markets where Cingular already provides service.¹²¹ In February 2004, the Commission approved assignment of these licenses from NextWave to Cingular.¹²²

¹¹⁶ *Cingular to Acquire AT&T Wireless, Create Nation's Premier Carrier*, News Release, Cingular Wireless, Feb. 17, 2004. AT&T Wireless and Cingular Wireless filed applications for Commission consent to the transfer of control in March 2004. See Application No. 0001656065 (filed Mar. 17, 2004).

¹¹⁷ *Id.*

¹¹⁸ *Cingular to Acquire AT&T Wireless, Create Nation's Premier Carrier*, News Release, Cingular Wireless, Feb. 17, 2004. Some analysts argue that the acquisition is an attempt to offset the decline in Cingular's parent companies' wireline businesses. Almar Latour and Jesse Drucker, *Stocks of Cingular's Parents Ring Out*, WALL STREET JOURNAL, Feb. 2, 2004, at C1.

¹¹⁹ In a related transaction, Cingular Wireless, AT&T Wireless, and Triton PCS signed a non-binding letter of intent, contingent on the closing of Cingular Wireless's acquisition of AT&T Wireless, to trade Triton PCS's network in Virginia for certain AT&T Wireless network assets and customers in North Carolina and Puerto Rico. *Cingular, AT&T Wireless and Triton PCS Sign Letter of Intent to Exchange Operations in N. Carolina, Puerto Rico and Virginia*, News Release, Cingular Wireless, July 8, 2004. Additionally, AT&T Wireless and Triton PCS will terminate their exclusivity agreement in return for the surrender of AT&T Wireless's equity in Triton PCS. See Section III.D.5, Affiliations, *infra*.

¹²⁰ *Cingular Wireless and NextWave Telecom Agree to Terms for Spectrum Licenses*, News Release, Cingular Wireless, Aug. 5, 2003.

¹²¹ *Id.*

¹²² *Applications for Consent to the Assignment of Licenses Pursuant to Section 310(d) of the Communications Act from NextWave Personal Communications, Inc., Debtor-in-Possession, and NextWave Power Partners, Inc., Debtor-in-Possession, to subsidiaries of Cingular Wireless, Inc.*, Memorandum Opinion & Order, WT Docket No. 03-217, FCC 04-26 (rel. Feb. 12, 2004). Under the terms of the purchase agreement as well as the term sheet entered into between the United States Government and NextWave, following consummation of the transaction, Cingular paid \$714 million to the Commission for the benefit of the U.S. Treasury in full satisfaction of all claims related to the licenses it purchased.

67. *American Cellular / Dobson* – On August 19, 2003, Dobson announced that it had completed its acquisition of American Cellular Corporation (“American Cellular”), following the successful restructuring of American Cellular’s debt and equity ownership.¹²³ American Cellular had been equally owned by Dobson and AT&T Wireless, although Dobson operated the American Cellular markets, under the brand name “Cellular One.”¹²⁴ AT&T Wireless, which along with Dobson had acquired American Cellular in February 2000, no longer has an equity stake in the subsidiary.¹²⁵ The combined company provides service to roughly 1.6 million subscribers in 16 states using its TDMA/GSM network.¹²⁶

2. Joint Ventures

68. *T-Mobile / Western Wireless* – In May 2004, T-Mobile and Western Wireless announced an agreement to expand GSM/GPRS coverage in the western United States.¹²⁷ Under the agreement, Western Wireless is building a GSM/GPRS network to cover approximately 4 million people in 65 BTAs using PCS spectrum purchased from T-Mobile.¹²⁸ The spectrum is primarily in areas where Western Wireless has already constructed a network, but where T-Mobile has not.¹²⁹ By overlaying a GSM network on top of Western Wireless’s existing infrastructure, the companies hope to realize significant economic and resource efficiencies by utilizing Western Wireless’s existing leases, tower structures, and other components of its cellular network.¹³⁰ Western Wireless plans to sell roaming services both to T-Mobile and other operators, and may also utilize the network for its own retail customers.¹³¹

69. *Cingular / T-Mobile* – In May 2004, Cingular and T-Mobile announced that they were ending their infrastructure sharing joint venture in California, Nevada, and New York.¹³² Under terms of the deal, T-Mobile will pay \$2.5 billion for Cingular’s network in California and Nevada, and will

¹²³ *Dobson Communications Completes Acquisition Of American Cellular Corporation*, News Release, Dobson, Aug. 19, 2003.

¹²⁴ *Eighth Report*, at 14810-14811, note 196.

¹²⁵ *Dobson Communications Completes Acquisition Of American Cellular Corporation*, News Release, Dobson, Aug. 19, 2003.

¹²⁶ *Id.* On Sept. 22, 2003, AT&T Wireless sold all of its ownership interest in Dobson’s common stock. AT&T Wireless, Annual Report 2003, at 41.

¹²⁷ *T-Mobile USA and Western Wireless To Expand GSM/GPRS 1900 Footprint in Rural U.S.*, News Release, T-Mobile, May 5, 2003.

¹²⁸ *Id.*; ULS File No. 0001406731 (filed Aug. 20, 2003).

¹²⁹ ULS File No. 0001406731 (filed Aug. 20, 2003).

¹³⁰ *Id.*

¹³¹ *Id.*

¹³² *Cingular, T-Mobile USA To End Joint Network Venture*, News Release, Cingular Wireless, May 25, 2004. See *Seventh Report*, at 13001, and *Eighth Report*, at 14808, for a description of the venture.

receive \$200 million for unwinding the venture.¹³³ In addition, Cingular is selling T-Mobile 10 MHz of spectrum in San Francisco, Sacramento, and Las Vegas for \$180 million, but will receive 10 MHz of spectrum in New York City.¹³⁴ The companies expect the deal to close at the beginning of 2005.¹³⁵ The transaction is contingent on Cingular's acquisition of AT&T Wireless, as well as regulatory approval once the transaction between Cingular and T-Mobile is submitted to the Commission.¹³⁶

3. Restructurings

70. *Leap Bankruptcy* – As reported in the *Eighth Report*, on April 13, 2003, Leap Wireless International, Inc. (“Leap”)¹³⁷ filed a voluntary petition for reorganization under Chapter 11 of the U.S. Bankruptcy Code in the United States Bankruptcy Court for the Southern District of California.¹³⁸ On October 22, 2003, the Bankruptcy Court approved Leap’s Fifth Amended Joint Plan of Reorganization.¹³⁹ The company’s emergence from bankruptcy is contingent on obtaining FCC approval for assignment of its wireless licenses.¹⁴⁰

71. *Ntelos Bankruptcy* – As reported in the *Eighth Report*, Ntelos, Inc. (“Ntelos”) filed for Chapter 11 bankruptcy protection in the U.S Bankruptcy Court for the Eastern District of Virginia on March 4, 2003.¹⁴¹ Ntelos, which had 266,000 wireless customers at the end of 2002, had missed interest payments of more than \$24 million on loans from commercial debt holders in February 2003.¹⁴² On September 9, 2003, Ntelos announced that it had completed its financial restructuring and emerged from

¹³³ Taska Manzaroli, *Deutsche Telekom to Acquire Cingular Network in Two States*, DOW JONES NEWSWIRE, May 25, 2004.

¹³⁴ COMMUNICATIONS DAILY, May 26, 2004, at 5.

¹³⁵ Taska Manzaroli, *Deutsche Telekom to Acquire Cingular Network in Two States*, DOW JONES NEWSWIRE, May 25, 2004.

¹³⁶ *Id.* See also ULS File No. 0001771442.

¹³⁷ See Section VII.A.2, Wireless Alternatives, *infra*, for a discussion of Leap’s service offerings.

¹³⁸ See *Eighth Report*, at 14808.

¹³⁹ Order Confirming Debtor’s Fifth Amended Joint Plan of Reorganization, *In re: Leap Wireless International, Inc., and Cricket Communications, Inc., et al.*, Case Nos. 03-3470-All through 03-3535-All, (Bankr. S. D. Cal.) (Oct. 22, 2003).

¹⁴⁰ ULS File No. 0001546977 has been designated as the lead application, and all pleadings and other submissions filed in the matter that pertain generally to the transaction and not to a particular application are available through this file number. See also, Leap Wireless International, Inc., Debtor-in-Possession, Seeks FCC Consent for the Assignment of Broadband Personal Communications Services Licenses to Leap Wireless International, Inc., *Public Notice*, 18 FCC Rcd 26763 (2003).

¹⁴¹ *Eighth Report*, at 14809.

¹⁴² NTELOS in Active Discussions with Debtholders, News Release, Ntelos, Feb. 18, 2003.

Chapter 11 proceedings.¹⁴³ The company's Joint Plan of Reorganization, which was confirmed by the U.S. Bankruptcy Court for the Eastern District of Virginia on August 12, 2003, became effective on September 9, 2003.¹⁴⁴ Under the company's Joint Plan of Reorganization the restructured company will be privately held, primarily by former noteholders.¹⁴⁵ Existing shares of Ntelos common stock (NTLOQ) were cancelled, along with the company's senior and subordinated notes and outstanding preferred stock.¹⁴⁶ The company still provides service in Virginia, West Virginia, Kentucky, Tennessee, and North Carolina.¹⁴⁷

72. *NextWave Telecommunications Inc. and NextWave Power Partners, Inc.* ("NextWave") – NextWave was the high bidder for 95 C, D, E and F block broadband PCS licenses covering 174 million POPs in auctions held between 1995 and 1997. On June 8, 1998, NextWave filed for Chapter 11 bankruptcy protection in the U.S. Bankruptcy Court for the Southern District of New York. Following extensive litigation, the U.S. Supreme Court held that NextWave's licenses had not automatically cancelled for non-payment while it was in bankruptcy.¹⁴⁸ As part of its reorganization process, NextWave obtained FCC approval to transfer certain of its C and F block PCS licenses to Cingular.¹⁴⁹ In April 2004, NextWave entered a settlement agreement with the FCC whereby it will retain certain of its C and F block licenses, and will return the remaining licenses to the FCC. On May 25, 2004, this settlement agreement was approved by the bankruptcy court.¹⁵⁰

73. *Horizon PCS Bankruptcy* – On August 15, 2003, Horizon PCS, Inc. ("Horizon PCS"), a Sprint PCS affiliate, announced that it had filed voluntary petitions for relief under Chapter 11 of Title 11 of the United States Code in the United States Bankruptcy Court for the Southern District of Ohio.¹⁵¹ Horizon PCS expects to continue to operate its business subject to the supervision and orders of the Bankruptcy Court pursuant to the Bankruptcy Code.¹⁵² Horizon PCS provides services under the Sprint

¹⁴³ *NTELOS Completes Restructuring and Emerges From Chapter 11*, News Release, Ntelos, Sept. 9, 2003. See also, ULS File Nos. 0001433008, 0001433014, 0001433028, 0001433042, 0001433048, 0001433051, 0001433045, 0001433033, 0001433010, and 0001433442.

¹⁴⁴ *Id.*

¹⁴⁵ *Id.*

¹⁴⁶ *Id.*

¹⁴⁷ See <http://www.ntelos.com>.

¹⁴⁸ *FCC v. NextWave*, 537 U.S. 293 (2003).

¹⁴⁹ *Applications for Consent to the Assignment of Licenses Pursuant to Section 310(d) of the Communications Act from NextWave Personal Communications, Inc., Debtor-in-Possession, and NextWave Power Partners, Inc., Debtor-in-Possession, to subsidiaries of Cingular Wireless, Inc.*, Memorandum Opinion & Order, WT Docket No. 03-217, FCC 04-26, (rel. Feb. 12, 2004).

¹⁵⁰ *Order Granting Motion Pursuant to Section 363 of the Bankruptcy Code, In re: NextWave Personal Communications, Inc. et al.*, 98B21529 (Bankr. S.D.N.Y.) (May 25, 2004).

¹⁵¹ *Horizon PCS Files For Bankruptcy Protection Under Chapter 11*, News Release, Horizon PCS, Aug. 15, 2003.

¹⁵² *Id.*

brand name in markets covering 10.2 million people in portions of 12 states.¹⁵³ To settle a legal dispute, in May 2004 Sprint agreed to pay \$38 million to buy Horizon PCS's customer base (97,000 customers) and retail stores in western Virginia and West Virginia.¹⁵⁴ The company was serving 310,000 subscribers as of June 30, 2003.¹⁵⁵

74. *Monet Mobile Networks Bankruptcy and Suspension of Service* – On March 11, 2004, Monet Mobile Networks (“Monet”), which had been providing data-only broadband service using its CDMA 1xEV-DO network in eight northwestern cities, suspended its service.¹⁵⁶ Monet, which had been serving about 3,000 customers, filed for Chapter 11 bankruptcy on March 4, 2004, when it was unable to find lenders willing to extend it additional financing.¹⁵⁷ The company had been looking to become acquired by another company since November 2003, but had not found any interested buyers.¹⁵⁸ Monet launched North America’s first CDMA 1xEV-DO network in November 2002.¹⁵⁹

4. Exiting Facility-Based Provision of Service

75. *Qwest Wireless* – As mentioned above, in August 2003 Qwest entered into an agreement with Sprint to resell Sprint PCS wireless services, having decided to exit the facilities-based provision of wireless service.¹⁶⁰ Under the five year agreement, Qwest retains control of all sales and marketing, customer service, billing and collection, pricing, promotion, and product offerings related to the Sprint services that it resells. Qwest began offering these Sprint services under its own brand name, Qwest Wireless, in March 2004.¹⁶¹ Qwest’s customers who are currently being serviced through Qwest’s own broadband PCS network are being transitioned onto Sprint’s network over time.¹⁶² On July 2, 2004, Verizon Wireless announced an agreement to acquire Qwest’s PCS licenses and network assets, but not

¹⁵³ *Id.*

¹⁵⁴ David Hayes, *Sprint Settles Lawsuit By Agreeing To Pay \$38 Million*, KANSAS CITY STAR, May 18, 2004.

¹⁵⁵ Horizon PCS, SEC Form 10-Q, Aug. 15, 2003, at 17. Ntelos, a network partner for Horizon PCS, operates 13 markets for Horizon in Virginia and West Virginia, covering approximately 2 million POPs and 70,000 subscribers. Dan Myers, *More Sprint PCS Affiliates Warn Of Tough Road Ahead*, RCR WIRELESS NEWS, Apr. 7, 2003. See, also, *Eighth Report* at 14811, note 204, for a discussion of the relationship between Horizon PCS and Ntelos.

¹⁵⁶ Monet Mobile Networks, *Monet Mobile Networks To Suspend Service* (visited May 14, 2004) <http://www.monetmobile.com/cust_buy.asp>.

¹⁵⁷ Mike Dano, *Nation’s First DO Operator Shuts Down*, RCR WIRELESS, Mar. 8, 2004.

¹⁵⁸ *Id.*

¹⁵⁹ *Id.*

¹⁶⁰ Qwest Corp, SEC Form 10-K, Filed Mar. 16, 2004, at 5-6.

¹⁶¹ *Id.*

¹⁶² *Id.*

customers, for \$418 million.¹⁶³

5. Affiliations

76. Three of the nationwide operators also have extended their coverage through contractual affiliations with smaller carriers. These affiliations create a “family” of operating companies with much closer relationships than those formed by traditional roaming agreements.¹⁶⁴ All of these affiliations were established to accelerate the build-out of the larger companies’ networks by granting smaller affiliates the exclusive right to offer mobile services for those companies, in some cases under the larger companies’ brand names, in selected mid-sized and smaller markets.¹⁶⁵

77. *AT&T Wireless* – The AT&T Wireless family consists of AT&T Wireless, as well as its affiliations with two companies: Triton PCS and Edge Wireless, LLC (“Edge”).¹⁶⁶ AT&T Wireless sold portions of some of its broadband PCS licenses to Triton PCS in exchange for a minority ownership interest.¹⁶⁷ While Triton PCS is marketed under the brand name SunCom¹⁶⁸ and Edge is marketed under its own name, both companies provide service as a “Member of the AT&T Wireless Network.” These affiliates, like AT&T Wireless, have committed to upgrading their TDMA networks to GSM/GPRS.¹⁶⁹ AT&T Wireless and Triton PCS recently announced an agreement, contingent on Cingular Wireless’s acquisition of AT&T Wireless, to terminate the exclusivity arrangement between the two in exchange for the surrender of AT&T Wireless’s equity in Triton PCS.¹⁷⁰

¹⁶³ *Verizon to Pay \$418 Million For Qwest's Wireless Assets*, WALL STREET JOURNAL, July 2, 2004, at B4. In its 2003 10-K, Qwest had announced its intention to transfer ownership of its network “in the near future, after which [Qwest] will no longer have significant wireless operations.” Qwest Corp., SEC Form 10-K, filed Mar. 16, 2004, at 27.

¹⁶⁴ See Section IV.B.3 Roaming, *infra*.

¹⁶⁵ See, e.g., Nextel, Automatic and Manual Roaming Obligations Pertaining to Commercial Mobile Radio Services, WT Docket No. 00-193, *Comments*, at note 20 (filed Jan. 5, 2001) (“To facilitate rapid deployment of its network throughout suburban, tertiary and rural areas of the country and move towards more ubiquitous nationwide service, Nextel entered into an agreement with Nextel Partners . . . to construct iDEN coverage using Commission licensed frequencies disaggregated by Nextel to [Nextel Partners], and offering its services to the public under the Nextel brand according to strict service quality standards.”).

¹⁶⁶ In addition, AT&T Wireless owns 19.9 percent of Cincinnati Bell Wireless, LLC (“Cincinnati Bell Wireless”). Cincinnati Bell, SEC Form 10-K, Mar. 23, 2004, at 4. These services are sold under the Cincinnati Bell Wireless brand name. AT&T Wireless and Cincinnati Bell Wireless have a non-compete clause. Lance Williams, *Cincinnati Bell Might Sell Wireless Unit*, CINCINNATI BUSINESS COURIER, Mar. 5, 2004.

¹⁶⁷ AT&T Wireless owns 15.7 percent of Triton PCS and 40 percent of Edge. AT&T Wireless, FCC Form 602 (filed Mar. 16, 2004). Even with its close relationship with AT&T Wireless, Triton PCS determines its own service offerings, the terms under which services are offered, and its own prices. Lafayette Communications Company, LLC, FCC Application for Assignment of Authorization, #0001108216 (filed Dec. 4, 2002), at 2. AT&T has an agreement with Triton PCS to not compete in Triton PCS’s six southeastern states until 2009. Jessica Hall, *Triton PCS Eyes Some Cingular-AT&T Wireless Assets*, REUTERS, Mar. 3, 2004.

¹⁶⁸ Suncom, *Suncom Fact Sheet* (visited May. 17, 2004) <http://www.suncom.com/pr_news/index.shtml>.

¹⁶⁹ See *Eighth Report*, at 14811.

¹⁷⁰ *Cingular, AT&T Wireless and Triton PCS Sign Letter of Intent to Exchange Operations in N. Carolina, Puerto Rico and Virginia*, News Release, Cingular Wireless, July 8, 2004. Under the agreement, Triton PCS would

78. *Nextel* – The Nextel family consists of Nextel and Nextel Partners, Inc. (“Nextel Partners”). In an arrangement similar to that of AT&T Wireless with its affiliates,¹⁷¹ in 1999, Nextel sold some of its SMR licenses to Nextel Partners in exchange for a minority ownership interest in the company.¹⁷² Nextel Partners is building out an iDEN network compatible with Nextel’s, and Nextel assists Nextel Partners in obtaining terms similar to those Nextel receives from vendors for equipment and services.¹⁷³ Both Nextel and Nextel Partners market their services under the Nextel brand name.

79. *Sprint PCS* – The Sprint PCS family consists of Sprint PCS and 10 affiliates.¹⁷⁴ Each of the affiliates has an agreement with Sprint PCS to use the latter’s PCS licenses to deploy CDMA technology and Sprint PCS-branded service in specific areas of the country.¹⁷⁵ In return, Sprint PCS receives a percentage of the affiliates’ local service revenue.¹⁷⁶ In addition, Sprint PCS performs back-office tasks for most of its affiliates, giving them the benefits of economies of scale for billing and customer service.¹⁷⁷ Recently, Sprint has renegotiated these arrangements with some of its affiliates, responding to disputes with, as well as the financial difficulties of, certain affiliates.¹⁷⁸ The amended agreements cover approximately 40 percent of the customers served by all affiliates.¹⁷⁹ Sprint PCS affiliates now provide service to more than 2.9 million subscribers.¹⁸⁰

be permitted to compete beyond its current footprint, and Cingular Wireless could provide service in areas where Triton PCS currently has operations. Triton PCS would also have exclusive right to the SunCom brand. *Cingular, AT&T Wireless and Triton PCS Sign Letter of Intent to Exchange Operations in N. Carolina, Puerto Rico and Virginia*, News Release, Cingular Wireless, July 8, 2004.

¹⁷¹ For a comparison of the affiliate arrangements of AT&T, Nextel, and Sprint PCS, see Luiz Carvalho *et al.*, *Triton PCS*, Morgan Stanley, Equity Research, Mar. 5, 2003, at 2 (Exhibit 1: Difference Among the Affiliates).

¹⁷² Nextel Partners, Inc., SEC Form 10-K, Mar. 22, 2002, at 4. Nextel owns 30 percent of Nextel Partners. Nextel, FCC Form 602 (filed Mar. 15, 2004).

¹⁷³ *Id.*, at 3.

¹⁷⁴ Five are public companies (Alamosa Holdings Inc., US Unwired Inc., AirGate PCS Inc., UbiquiTel Inc., Horizon PCS Inc., and Shenandoah Telecommunications Co.) and five are privately-held. See *Eighth Report*, at 14811, note 203. See, also, Section III.D.3, Restructurings *supra*, for a discussion of Horizon PCS’s bankruptcy.

¹⁷⁵ See, e.g., US Unwired Inc., SEC Form 4249(B)(1), May 17, 2000, at 7.

¹⁷⁶ See, e.g., Horizon PCS, SEC Form 10-Q, Aug. 15, 2003, at 8.

¹⁷⁷ See *Eighth Report*, at 14812.

¹⁷⁸ Sprint, SEC Form 10-K, filed Mar. 9, 2004, at 36. See, also, Section III.D.3, Restructurings, *supra*, and *Eighth Report*, at 14809. Sprint has amended the existing agreements to provide for a “simplified pricing mechanism, as well as refining and changing various business processes.” Sprint, SEC Form 10-K, filed Mar. 9, 2004, at 36. For a description of Sprint’s revised agreement with Alamosa, see John Byrne, *Bondholders Skeptical of Alamosa Restructuring Bid*, KAGAN WIRELESS TELECOM INVESTOR, Sept. 25, 2003, at 8.

¹⁷⁹ Sprint, SEC Form 10-K, filed Mar. 9, 2004, at 36.

¹⁸⁰ *Sprint Reports Fourth Quarter and Full-Year 2003 Results*, News Release, Sprint, Feb. 3, 2004.

E. Entry Conditions and Potential Barriers to Entry

80. Market concentration is a necessary, but not a sufficient structural condition for unilateral or coordinated anti-competitive behavior to occur. If entry into a market is easy, then entry or the threat of entry may prevent incumbent operators from exercising market power, either collectively or unilaterally, even in highly concentrated markets.¹⁸¹ The ease or difficulty of entry generally depends on the nature and significance of entry barriers. Barriers to entry in the mobile telecommunications market may include first-mover advantages, large sunk costs, and access to spectrum.¹⁸²

1. Spectrum Allocation and Assignment

81. Spectrum allocation and assignment create a potential barrier to entry into mobile telecommunications markets because a limited amount of spectrum is allocated to CMRS and carriers need to obtain a government-issued license in order to use such spectrum for the provision of CMRS services. However, the degree to which the need to obtain a license acts as an impediment to entry depends on several factors. The first is the total amount of spectrum allocated to CMRS services and, of the spectrum that has been allocated, the amount actually assigned to users. This section identifies the types and amount of spectrum currently allocated to CMRS. While much of this CMRS spectrum is already licensed to carriers, some portions of current CMRS spectrum represent relatively recent allocations that the Commission plans to auction to spectrum users in the future. Moreover, in June 2004 the Commission announced an auction to commence on January 12, 2005 (Auction No. 58) for 234 broadband PCS licenses comprising CMRS spectrum that had been offered previously in other auctions but was returned to the Commission as a result of license cancellation or termination.¹⁸³ Finally, in addition to current CMRS spectrum due to be auctioned (or re-auctioned) and licensed in the future, the amount of spectrum allocated to CMRS has the potential to increase as a result of the future reallocation of additional frequencies from non-CMRS to CMRS services. The resulting increase in the supply of CMRS spectrum due to both factors could potentially have the effect of reducing spectrum-related entry barriers, depending on the extent to which the demand for CMRS services increases.

82. Given the total amount of spectrum allocated to CMRS and assigned to users, the impact of spectrum allocation and assignment on the ease or difficulty of market entry also depends on the Commission's rules and policies with regard to spectrum assignment and trading. In this regard, the Commission's efforts to shift to a more market-based approach to spectrum management have resulted in the adoption of several policies that tend to reduce barriers to entry arising from spectrum allocation and assignment. First, beginning with the PCS auctions, the Commission's use of auctions to assign spectrum marked the transition from its restrictive cellular licensing rules that limited entry by licensing a prescribed number of competitors in each market area to a more flexible licensing approach that allows market forces to determine the number of competitors in a given geographic area. Thus, whereas the licensing of cellular spectrum bands created a duopoly in each market, the auctioning of PCS spectrum produced the significant variation in the number of mobile telephony carriers across different geographic

¹⁸¹ See DOJ/FTC Guidelines at §3.0; see also Dennis W. Carlton and Jeffrey M. Perloff, *Modern Industrial Organization* (3rd ed., Addison, Wellsley, Longman, Inc., 1999), at 77.

¹⁸² See *Spectrum Aggregation R&O*, 16 FCC Rcd at 22688-91, ¶¶ 39-43.

¹⁸³ Broadband PCS Spectrum Auction Scheduled For January 12, 2005, *Public Notice*, DA 04-1639, Report No. AUC-03-58-A (Auction No. 58) (rel. June 18, 2004). Some of the spectrum to be re-auctioned was returned as a result of the previously mentioned settlement agreement between the FCC and NextWave. See Section III.D.3, *Restructurings, supra*.

regions described in Section III.C.1 above. As shown in Section III.C.3 above, the Commission's market-based policies have resulted in significantly greater numbers of mobile competitors entering many regional geographic markets as compared with countries in Western Europe and Asia that limited entry by licensing just three or four nationwide 2G operators.

83. Second, the Commission's rules afford carriers the flexibility to choose what services to offer and what technologies to deploy on spectrum allocated to mobile telephony services, including the freedom to upgrade their existing systems and services to more advanced next-generation standards.¹⁸⁴ This service and technological flexibility reduces entry barriers by allowing mobile carriers to enter markets for new services without having to obtain a specific new government-issued license prior to doing so.

84. Finally, mobile telephony carriers are allowed, subject to the Commission's authorization and approval, to buy and sell licenses, in whole or in part, on the secondary market. As a result, carriers can enter the market by purchasing a license from incumbent license holders, rather than being limited to obtaining a license directly from the government.

85. Building on these market-oriented spectrum management policies, the Commission continues to take steps to increase spectrum access through secondary trading and flexible use. For example, in the Secondary Markets Report & Order ("*Secondary Markets R&O*"), issued in 2003, the Commission took action to facilitate the development of secondary markets in spectrum usage rights in a number of services.¹⁸⁵ The Commission allowed licensees in the Wireless Radio Services, including CMRS, to lease all or a portion of their spectrum usage rights, for any length of time within the license term, and over any geographic area encompassed by the license. In addition to introducing spectrum leasing in many wireless services, the Commission reduced the review time for transfer/assignment applications. As a result, licensees that utilize only a portion of their licensed spectrum (in terms of bandwidth or geographic area), and entities that seek to gain access to spectrum, have additional opportunities and face fewer impediments to moving the unused portion of this asset to higher valued uses. In a follow-up *Secondary Markets Second R&O* adopted in July 2004, the Commission further streamlined the processing of applications and notifications where the parties certify that the proposed transaction meets specific criteria indicating the absence of potential public interest concerns relating to eligibility, use restrictions, foreign ownership, designated entity policies, and competition.¹⁸⁶ Lease filings and transfer/assignment applications that meet these criteria will be eligible for overnight electronic processing.

a. Cellular, Broadband PCS, and SMR

86. Currently, mobile telephone operators primarily use three types of spectrum licenses to provide mobile voice and, in most cases, mobile data services: cellular, broadband PCS, and SMR.¹⁸⁷

¹⁸⁴ 47 C.F.R. §§ 20.901(a) and 24.3.

¹⁸⁵ Promoting Efficient Use of Spectrum through Elimination of Barriers to the Development of Secondary Markets, *Report and Order and Further Notice of Proposed Rulemaking*, 18 FCC Rcd 20604 (2003) ("*Secondary Markets Second R&O*").

¹⁸⁶ FCC Expands Spectrum Leasing Rules and Speeds Processing to Create Additional Opportunities for Access to Spectrum Through Secondary Markets, *News Release*, Federal Communications Commission, Jul. 8, 2004.

¹⁸⁷ See Appendix B, Table 1 and Maps 11-14, at B-11 – B-15, for descriptions and maps of various geographical licensing schemes employed by the Commission.

This information is provided as a basis for understanding the formation of the current industry structure.

87. Cellular – The Commission began licensing commercial cellular providers in 1982 and completed licensing the majority of operators by 1991. The Commission divided the United States and its possessions into 734 cellular market areas (“CMAs”), including 305 Metropolitan Statistical Areas (“MSAs”), 428 Rural Statistical Areas (“RSAs”), and a market for the Gulf of Mexico.¹⁸⁸ Two cellular systems were licensed in each market area. The Commission designated 50 megahertz of spectrum in the 800 MHz frequency band for the two competing cellular systems in each market (25 megahertz for each system). Initially, cellular systems offered service using analog technology, but today most of the service offered using cellular spectrum is digital.¹⁸⁹

88. Broadband PCS – Broadband PCS is similar to cellular service, except that broadband PCS systems operate in different spectrum bands and have been designed from the beginning to use a digital format. Broadband PCS licenses have been assigned through auction, beginning in 1995.¹⁹⁰ The most recent broadband PCS auction was completed in 2001.¹⁹¹ The Commission has set aside the spectrum between 1850 MHz and 1990 MHz for broadband PCS. This spectrum includes 120 megahertz used for mobile telephony, divided originally into three blocks of 30 megahertz each (blocks A, B, and C) and three blocks of 10 megahertz each (blocks D, E, and F).¹⁹² Two of the 30 megahertz blocks (A and B blocks) are assigned on the basis of 51 Major Trading Areas (“MTAs”).¹⁹³ One of the 30 megahertz

¹⁸⁸ Under the original cellular licensing rules, one of the two cellular channel blocks in each market (the B block) was awarded to a local wireline carrier, while the other block (the A block) was awarded competitively to a carrier other than a local wireline incumbent. After awarding the first 30 MSA licenses pursuant to comparative hearing rules, the Commission adopted rules in 1984 and 1986 to award the remaining cellular MSA and RSA licenses through lotteries. By 1991, lotteries had been held for every MSA and RSA, and licenses were awarded to the lottery winners in most instances. In some RSA markets, however, the initial lottery winner was disqualified from receiving the license because of a successful petition to deny or other Commission action. Implementation of Competitive Bidding Rules to License Certain Rural Service Areas, *Report and Order*, 17 FCC Rcd 1960, 1961-1962 (2002). In 1997, the Commission auctioned cellular spectrum in areas unbuilt by the original cellular licensees. See FCC, *Auction 12: Cellular Unserved* (visited Apr. 12, 2002) <<http://wireless.fcc.gov/auctions/12/>>. In 2002, the Commission auctioned three RSA licenses where the initial lottery winner had been disqualified. See FCC, *Auction 45: Cellular RSA* (visited Jun. 7, 2002) <<http://wireless.fcc.gov/auctions/45/>>.

¹⁸⁹ See Section VI.B.1, Subscriber Growth, *infra*.

¹⁹⁰ The first auction was for two license blocks of 30 megahertz each. *FCC Grants 99 Licenses For Broadband Personal Communications Services In Major Trading Areas*, News Release, FCC, Jun. 23, 1995. The Commission has had five additional broadband PCS auctions. See FCC, *Auctions Home* (visited Apr. 29, 2003) <<http://wireless.fcc.gov/auctions/>>. Three licenses were also awarded as part of a pioneer preference program in 1994. *Three Pioneer Preference PCS Applications Granted*, News Release, FCC, Dec. 14, 1994.

¹⁹¹ See *Sixth Report*, at 13368. See also, *Disposition of Down Payment and Pending Applications By Certain Winning Bidders in Auction No. 35; Requests for Refunds of Down Payments Made In Auction No. 35, Order and Order on Reconsideration*, 17 FCC Rcd 23354 (2002); and *Federal Communications Commission v. NextWave Personal Communications, et al.*, 537 U.S. 293 (2003).

¹⁹² The Commission’s broadband PCS allocation includes 20 megahertz of spectrum at 1910 MHz - 1930 MHz for unlicensed broadband PCS.

¹⁹³ Major Trading Areas are Material Copyright (c) 1992 Rand McNally & Company. Rights granted pursuant to a license from Rand McNally & Company through an arrangement with the Federal Communications Commission. Rand McNally’s MTA specification contains 47 geographic areas covering the 50 states and the

blocks (C block) and all three of the 10 megahertz blocks are assigned on the basis of 493 BTAs.¹⁹⁴ As noted above, the Commission has announced that it will hold another auction of broadband PCS spectrum in January of 2005.

89. SMR - The Commission first established SMR in 1979 to provide for land mobile communications on a commercial basis. The Commission initially licensed spectrum in the 800 and 900 MHz bands for this service, in non-contiguous bands, on a site-by-site basis.¹⁹⁵ The Commission has since licensed additional SMR spectrum through auctions.¹⁹⁶ In total, the Commission has licensed 19 megahertz of SMR spectrum, plus an additional 7.5 megahertz of spectrum that is available for SMR as well as other services.¹⁹⁷ While Commission policy permits flexible use of this spectrum, including the provision of paging, dispatch, mobile voice, mobile data, facsimile, or combinations of these services,¹⁹⁸

District of Columbia. For its spectrum auctions, the Commission has added three MTA-like areas: Guam and the Northern Mariana Islands, Puerto Rico and the U.S. Virgin Islands, and American Samoa. In addition, Alaska was separated from the Seattle MTA into its own MTA-like area. MTAs are combinations of two or more BTAs. See note 27 for a description of BTAs.

¹⁹⁴ In June 1998, broadband PCS C block licensees were permitted to elect to disaggregate their licenses and return 15 megahertz of C block spectrum to the Commission. As a result, a number of licensees elected to disaggregate some or all of their licenses, creating some BTAs with seven broadband PCS spectrum licenses. See Amendment of the Commission's Rules Regarding Installment Payment Financing for Personal Communications Services (PCS) Licensees, *Second Report and Order and Further Notice of Proposed Rule Making*, 12 FCC Rcd 16436 (1997); Amendment of the Commission's Rules Regarding Installment Payment Financing for Personal Communications Services (PCS) Licensees, *Order on Reconsideration of the Second Report and Order*, 13 FCC Rcd 8345 (1998). In August 2000, the Commission decided to reconfigure each 30 megahertz C block license available for auction, beginning with Auction No. 35, into three 10 megahertz licenses. Amendment of the Commission's Rules Regarding Installment Payment Financing for Personal Communications Services (PCS) Licensees, *Sixth Report and Order and Order on Reconsideration*, 15 FCC Rcd 16266, 16267 (2000).

¹⁹⁵ The "900 MHz" SMR band refers to spectrum allocated in the 896-901 and 935-940 MHz bands; the "800 MHz" band refers to spectrum allocated in the 806-824 and 851-869 MHz bands. See 47 C.F.R. § 90.603; see also 47 C.F.R. § 90.7 (defining "specialized mobile radio system").

¹⁹⁶ The Commission has held multiple auctions for SMR licenses. FCC, *FCC Auctions* (visited Mar. 7, 2002) <<http://wireless.fcc.gov/auctions/>>.

¹⁹⁷ There are five megahertz in the 900 MHz band (200 paired channels x 12.5 kHz/channel). See 47 C.F.R. § 90.617, Table 4B. There are 21.5 megahertz in the 800 MHz band: 14 megahertz in the 800 SMR Service (280 paired channels x 25 kHz/channel) and 7.5 megahertz in the 800 MHz General Category (150 paired channels x 25 kHz/channel). See 47 C.F.R. § 90.615, Table 1 (SMR General Category) and 47 C.F.R. § 90.617, Table 4A (SMR Service). In 2000, the Commission amended its rules to allow Business and Industrial/Land Transportation licensees in the 800 MHz band to use their spectrum for CMRS operations under certain conditions. Implementation of Sections 309(j) and 337 of the Communications Act of 1934 as Amended Promotion of Spectrum Efficient Technologies on Certain Part 90 Frequencies; Establishment of Public Service Radio Pool in the Private Mobile Frequencies Below 800 MHz; Petition for Rule Making of The American Mobile Telecommunications Association, *Report and Order and Further Notice of Proposed Rule Making*, 15 FCC Rcd 22709, 22760-61 (2000). This could make up to five megahertz of additional spectrum available for digital SMR providers: 2.5 megahertz in the Industrial/Land Transportation Category (50 paired channels x 25 kHz/channel) and 2.5 megahertz in the Business Category (50 paired channels x 25 kHz/channel). See 47 C.F.R. § 90.617, Tables 2A and 3A.

¹⁹⁸ Principles for Reallocation of Spectrum to Encourage the Development of Telecommunications Technologies for the New Millennium, Policy Statement, 14 FCC Rcd 19868 (1999); see also Applications of Various Subsidiaries and Affiliates of Geotek Communications, Inc., Debtor-In-Possession, Assignors, and

the primary use for SMR traditionally has been trunked dispatch services.¹⁹⁹ Dispatch differs from mobile voice communications offered by PCS and cellular carriers in that it allows both one-to-one and one-to-many communication (including real-time conferencing with groups), and it generally does not operate through interconnection with the public switched telephone network.²⁰⁰ SMR systems have also had the ability to offer interconnected service, but until the development of digital technologies, analog SMR systems had limited capacity to provide mobile telephony. In recent years, however, the nature of SMR service has evolved significantly. SMR providers such as Nextel and Southern LINC, a unit of energy concern Southern Company, have used digital technologies to increase spectral efficiency and to become more significant competitors in mobile telephony, while also providing dispatch functionality as a part of their service offerings.²⁰¹ Furthermore, in apparent response to the dispatch functionality of SMR services, some cellular and broadband PCS carriers have begun to offer push-to-talk functionality on their networks, including Verizon Wireless, Sprint PCS, and ALLTEL.²⁰² SMR spectrum is also used for certain data-only networks.²⁰³

90. Available Licenses and Spectrum Aggregation – In every geographical area of the country, the Commission initially authorized up to eight different mobile telephony licenses (two cellular and six broadband PCS), not including additional digital SMR licenses.²⁰⁴ Moreover, under Commission rules, broadband PCS, cellular, and auctioned SMR licensees may, with Commission approval, disaggregate (divide the spectrum into smaller amounts of bandwidth) or partition (divide the license into smaller

Wilmington Trust Company or Hughes Electric Corporation, Assignees, For Consent to Assignment of 900 MHz Specialized Mobile Radio Licenses, Memorandum Opinion and Order, 15 FCC Rcd 790, 802 (2000).

¹⁹⁹ Dispatch services allow two-way, real-time, voice communications between fixed units and mobile units (e.g., between a taxicab dispatch office and a taxi) or between two or more mobile units (e.g., between a car and a truck). See *Fifth Report*, at 17727-17728, for a detailed discussion. A number of providers continue to provide both commercial and private dispatch services at 800 MHz, 900 MHz, 220 MHz, 217-219 MHz, and 450-470 MHz. See Applications of Motorola, Inc.; Motorola SMR, Inc.; and Motorola Communications and Electronics, Inc. Assignors; and FCI 900, Inc., Assignee, For Consent to Assignment of 900 MHz Specialized Mobile Radio Licenses, *Order*, 16 FCC Rcd 8451 (2001) (“*Motorola Order*”). Dispatch and SMR are often used interchangeably, although SMR refers to specific spectrum ranges.

²⁰⁰ See The Strategis Group, THE STATE OF THE SMR INDUSTRY: NEXTEL AND DISPATCH COMMUNICATIONS (Sept. 2000), at 57; The Strategis Group, U.S. DISPATCH MARKETS (Jan. 2000), at 1. See also *Motorola Order*, at 8457.

²⁰¹ According to Nextel, “[We are] referred to as an ‘SMR provider’ . . . , although [our] services compete directly with and are regulated virtually identically to those of cellular and PCS providers.” Nextel, Automatic and Manual Roaming Obligations Pertaining to Commercial Mobile Radio Services, WT Docket No. 00-193, *Comments*, at note 4 (filed Jan. 5, 2001). However, in comparison with cellular and broadband PCS providers, digital SMR providers are more focused on the business than the individual consumer market. See, e.g., Nextel Communications, Inc., SEC Form 10-Q, Nov. 14, 2000, at 16.

²⁰² See Section IV.B.6, Provision of Ancillary Services and Promotional Offers, *infra*.

²⁰³ See Section IV.B.1.e, Data-Only Networks and Technology Deployment, *infra*.

²⁰⁴ Some areas may have fewer than eight active licenses because certain auction winners or licensees have defaulted on payments to the Commission, because some licensees did not meet their buildout requirements, some licensees returned their licenses, or some licenses remained unsold in an auction.

geographical areas) their licenses, or both, to other entities.²⁰⁵ Many licensees hold more than one license in a particular market. While no longer in operation, the Commission's CMRS spectrum cap molded the current distribution of spectrum licenses. Under the spectrum cap, no entity could control more than 45 megahertz of cellular, broadband PCS, and SMR²⁰⁶ spectrum in an MSA, or more than 55 megahertz in an RSA.²⁰⁷ In November 2001, however, the Commission raised the spectrum cap to 55 megahertz in all markets, and decided to eliminate the restriction entirely effective January 1, 2003.²⁰⁸

b. 800 MHz Band Reconfiguration and 1.9 GHz Spectrum Exchange

91. On July 8, 2004, the Commission adopted a new band plan for the 800 MHz band to resolve the problem of interference to public safety radio systems operating in the band from CMRS providers operating systems on channels in close proximity to those utilized by public safety entities.²⁰⁹ The new band plan addresses the root cause of the interference problem by separating generally incompatible technologies, with the costs of relocating 800 MHz incumbents to be paid by Nextel. To accomplish the reconfiguration, the Commission will require Nextel to give up rights to certain of its licenses in the 800 MHz band and all of its licenses in the 700 MHz band. In exchange, the Commission will modify Nextel's licenses to provide the right to operate on two five-MHz blocks in the 1.9 GHz band – specifically 1910-1915 MHz and 1990-1995 MHz – conditioned on Nextel fulfilling certain obligations specified in the Commission's decision. As a new entrant in the 1.9 GHz band, Nextel is also obligated to fund the transition of incumbent users to comparable facilities. The Commission determined that the overall value of the 1.9 GHz spectrum is \$4.8 billion, less the cost of relocating incumbent users. In addition, the Commission decided to credit to Nextel the value of the spectrum rights that Nextel will relinquish and the actual costs Nextel incurs to relocate all incumbents in the 800 MHz band. To the extent that the total of these combined credits is less than the assessed value of the 1.9 GHz spectrum rights, Nextel will make an anti-windfall payment equal to the difference to the United States Department of the Treasury at the conclusion of the relocation process.

c. Narrowband Spectrum

²⁰⁵ 47 C.F.R. § 24.714 (PCS); 47 C.F.R. § 22.948 (cellular); 47 C.F.R. §§ 22.948, 90.813, and 90.911 (auctioned SMR). As a result of partitioning and disaggregation, there often are more than eight cellular and broadband PCS licenses in a market.

²⁰⁶ No more than 10 megahertz of SMR spectrum was attributable to an entity under the cap. 47 C.F.R. § 20.6(b).

²⁰⁷ 47 C.F.R. § 20.6(a).

²⁰⁸ 2000 Biennial Regulatory Review Spectrum Aggregation Limits For Commercial Mobile Radio Services, *Report and Order*, 16 FCC Rcd 22668 (2001), *petitions for reconsideration pending* ("Spectrum Cap Order"). The increase to 55 megahertz took effect February 13, 2002. See 67 Fed. Reg. 1626 (Jan. 14, 2002). All license transfers are still subject to review by the Commission to determine whether they are in the public interest. *Spectrum Cap Order*, at 22670-22671.

²⁰⁹ FCC Adopts Solution to Interference Problem Faced by 800 MHz Public Safety Radio Systems, *News Release*, Federal Communications Commission, Jul. 8, 2004.

92. In addition to the spectrum that mobile telephone carriers use to offer both voice and data CMRS services, two additional spectrum bands – paging and narrowband PCS – are used by licensees to offer CMRS services that consist only of data communications. Spectrum designated for commercial messaging/paging is spread across several non-contiguous bands: 35-36 MHz, 43-44 MHz, 152-159 MHz, 454-460 MHz, and 929-932 MHz.²¹⁰ Each license consists of between 20 and 50 kilohertz.²¹¹ The Commission first allocated spectrum for paging in 1949 and licensed the spectrum on a site-by-site basis through the mid-1990s.²¹² In 2000 the Commission began auctioning additional paging licenses on a geographic area basis using EAs and MEAs.²¹³ The Commission completed its third paging auction on May 28, 2003.²¹⁴

93. Narrowband PCS spectrum is located in the 901-902 MHz, 930-931 MHz, and 940-941 MHz bands and allows licensees to offer an array of two-way data services such as text messaging.²¹⁵ The Commission first auctioned narrowband PCS spectrum in 1994.²¹⁶ Licenses consisted of between 50 and 100 kilohertz each and were offered on both a nationwide and regional basis.²¹⁷ On Sept. 25, 2003, the Commission completed an auction of six, 62.5 kilohertz regional narrowband PCS licenses.²¹⁸ Space Data Spectrum Holding, LLC won a package of 5 regional licenses covering the continental U.S. in this auction.²¹⁹ On Sept. 29, 2003, the Commission completed an auction of licenses covering 48 MTAs and ranging in size from 50 to 200 kilohertz.²²⁰ Space Data Spectrum Holding, LLC won 42 of the 48 licenses in this auction.

²¹⁰ FCC, *Paging (Lower) Bandplan*, <<http://wireless.fcc.gov/auctions/data/bandplans/pagingLwrband.pdf>>; FCC, *929 and 931 MHz Paging Bandplan*, <<http://wireless.fcc.gov/auctions/data/bandplans/auc26bnd.pdf>>.

²¹¹ *Id.*

²¹² Revision of Part 22 and Part 90 of the Commission's Rules to Facilitate Future Development of Paging Systems, Implementation of Section 309(j) of the Communications Act – Competitive Bidding, *Notice of Proposed Rulemaking*, 11 FCC Rcd 3108, 3109-3110 (1996).

²¹³ See 929 and 931 MHz Paging Auction Closes, *Public Notice*, DA 00-508 (rel. Mar. 6, 2000); *Seventh Report*, at 13050-13051.

²¹⁴ Lower and Upper Paging Bands Auction Closes, *Public Notice*, DA 03-1836 (rel. May 30, 2003).

²¹⁵ Implementation of Section 309(j) of the Communications Act – Competitive Bidding Narrowband PCS, PP Docket No. 93-253, *Third Memorandum Opinion and Order and Further Notice of Proposed Rulemaking*, 10 FCC Rcd 175 (1994).

²¹⁶ Announcing the High Bidders in the Auction of Ten Nationwide Narrowband PCS Licenses; Winning Bids Total \$617,006,674, *Public Notice*, PNWL 94-4 (Aug. 2, 1994).

²¹⁷ *Id.*; Announcing the High Bidders in the Auction of 30 Regional Narrowband PCS Licenses; Winning Bids Total \$490,901,787, *Public Notice*, PNWL 94-27 (rel. Nov. 9, 1994).

²¹⁸ Regional Narrowband PCS Spectrum Auction Closes, *Public Notice*, DA 03-3006 (rel. Oct. 1, 2003).

²¹⁹ Space Data offers a two-way telemetry service using balloon-based base stations operating at approximately 100,000 feet. With the additional spectrum purchased in Auctions 50 and 51, Space Data will be licensed for over 1.7 megahertz of the 3 megahertz of narrowband PCS spectrum. *Space Data Corporation Captures 262.5 kHz of New Spectrum – Controls Majority of Narrowband PCS*, Press Release, Space Data Corporation, Nov. 19, 2003.

²²⁰ Narrowband PCS Spectrum Auction Closes, *Public Notice*, DA 03-3012 (rel. Oct. 2, 2003).

d. 700 MHz Bands

94. As discussed in the *Eighth Report*, the 700 MHz spectrum is being reclaimed from use by broadcast services in connection with the transition of the analog television service to digital television.²²¹ The reclamation of television spectrum has been addressed in two parts, primarily as a result of different statutory requirements applicable to the two bands and differing degrees of incumbency in the two bands.²²² These two bands are the 698-746 MHz (known as the "Lower 700 MHz") band and the 746-806 MHz (or "Upper 700 MHz") band. The Upper 700 MHz Band is currently used by TV stations on Channels 60-69 and comprises 60 megahertz, while the Lower 700 MHz Band, which is used by TV stations on Channels 52-59, comprises 48 megahertz of spectrum.²²³

95. Seventy-eight megahertz of the total 108 megahertz of Upper and Lower 700 MHz spectrum will generally be open to a broad range of flexible uses.²²⁴ Pursuant to statutory mandate, licenses for this spectrum will be assigned through competitive bidding.²²⁵ These bands have many permissible uses: winning bidders may use the spectrum for fixed, mobile (including mobile wireless commercial services), and broadcast services.²²⁶ The Commission expects that many of the new technologies to be developed and deployed in this band will support advanced wireless applications.²²⁷ However, much of the Upper and Lower 700 MHz spectrum is currently encumbered by television broadcasters, and may remain so until the end of period when broadcasters convert from analog to digital transmission systems.²²⁸ That the period is defined by statute.²²⁹ Nevertheless, there may be some portions of these bands that are not so encumbered and are available for immediate use by winning bidders.

²²¹ See *Eighth Report*, at 14798-14799.

²²² Reallocation and Service Rules for the 698-746 MHz Spectrum Band (Television Channels 52-59), GN Docket No. 01-74, *Notice of Proposed Rulemaking*, 16 FCC Rcd 7278, 7282 (2001).

²²³ The Commission has allocated 24 megahertz of the Upper 700 MHz band for use by public safety entities, pursuant to Section 337(a) of the Communications Act. 47 U.S.C. § 337(a).

²²⁴ See Reallocation and Service Rules for the 698-746 MHz Spectrum Band (Television Channels 52-59), GN Docket No. 01-74, *Report and Order*, 17 FCC Rcd 1022 (2002) ("*Lower 700 MHz Report and Order*"); Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, WT Docket No. 99-168, *Third Report and Order*, 16 FCC Rcd 2703 (2001); Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, WT Docket No. 99-168, *Second Memorandum Opinion and Order*, 16 FCC Rcd 1239 (2001); Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, WT Docket No. 99-168, *Memorandum Opinion and Order and Further Notice of Proposed Rulemaking*, 15 FCC Rcd 20845 (2000); Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, WT Docket No. 99-168, *Second Report and Order*, 15 FCC Rcd 5299 (2000) ("*Upper 700 MHz Second Report and Order*").

²²⁵ See *Lower 700 MHz Report and Order*, at 1024; *Upper 700 MHz Second Report and Order*, at 5301-2.

²²⁶ *Id.*

²²⁷ *Lower 700 MHz Report and Order*, at 1032.

²²⁸ *Id.*, at 1028.

²²⁹ See 47 U.S.C. § 309(j)(14)(A)-(B).

96. The Balanced Budget Act of 1997 and subsequent legislation initially directed the Commission to license these reclaimed spectrum bands well in advance of the end of the DTV transition period.²³⁰ However, after the Commission had scheduled auctions of the Upper 700 MHz band (Auction No. 31) and Lower 700 MHz band (Auction No. 44) pursuant to statutory deadlines established in that legislation,²³¹ the Auction Reform Act of 2002 eliminated these statutory deadlines²³² and provided the Commission with discretion to “determine the timing of and deadlines for the conduct of competitive bidding under [Section 309(j) of the Communications Act of 1934, as amended], including the timing of, and deadlines for, qualifying for bidding; conducting auctions; collecting, depositing, and reporting revenues; and completing licensing processes and assigning licenses.”²³³ The Auction Reform Act further ordered the Commission to delay the A, B, and E block portion of Auction No. 44 (Lower 700 MHz) and the entire Auction No. 31 (Upper 700 MHz), yet it also directed the Commission to proceed with an auction of the C and D blocks starting “no earlier than August 19, 2002, and no later than September 19, 2002.”²³⁴

97. On September 18, 2002, the initial auction of Lower 700 MHz C and D block licenses (Auction No. 44) closed, raising \$88.7 million in net bids.²³⁵ The Commission offered 740 licenses: one 12 megahertz license in 734 CMAs, and one 6 megahertz license in 6 Economic Area Groupings (“EAG”).²³⁶ The Commission selected CMAs as the license areas in part to address the needs of small, regional, and rural carriers.²³⁷ A total of 102 bidders won 484 licenses;²³⁸ 47 of the winning bidders were rural telcos, and they won 136 licenses.²³⁹ On June 13, 2003, the Commission completed the auction (Auction No. 49) of the remaining 256 licenses in the Lower 700 MHz band C and D blocks that did not

²³⁰ Balanced Budget Act of 1997, Pub. L. No. 105-33, 111 Stat. 251 § 3003 (1997) (adding new Section 309(j)(14) to the Communications Act of 1934, as amended); § 3007 (uncodified; reproduced at 47 U.S.C. § 309(j) note 3); Consolidated Appropriations Act, 2000, Pub. L. No. 106-113, 113 Stat. 2502, App. E, § 213, 145 Cong. Rec. H12493-94 (Nov. 17, 1999) (“Consolidated Appropriations Act”); 47 U.S.C. § 309(j)(14)(C)(ii).

²³¹ The Commission initially announced that it would conduct both auctions starting on June 19, 2002. Later, on May 24, 2002, the Commission announced that Auction No. 31 was postponed until January, 2003. Auction of Licenses in the 747-762 and 777-792 MHz Band (Auction No. 31) Postponed Until January 14, 2003; Auction of Licenses in the 698-746 MHz Band (Auction No. 44) Will Proceed As Scheduled, *Public Notice*, FCC 02-158, Report No. AUC-02-31-F (Auction No. 31) and AUC-02-44-D (Auction No. 44) (rel. May 24, 2002).

²³² Auction Reform Act of 2002, Pub. L. No. 107-195, 116 Stat. 715 (“*Auction Reform Act*”).

²³³ 47 U.S.C. § 309(j)(15), as added by the Auction Reform Act.

²³⁴ 47 U.S.C. § 309(j)(15)(C)(iii), as enacted by the Auction Reform Act.

²³⁵ FCC, Auction 44: Lower 700 MHz Band, *Factsheet* (visited Mar. 11, 2003) <<http://wireless.fcc.gov/auctions/44/factsheet.html>>.

²³⁶ *Id.*

²³⁷ Lower 700 MHz Report and Order, at 1061-1062.

²³⁸ FCC, Auction 44: Lower 700 MHz Band, *Factsheet* (visited Mar. 11, 2003) <<http://wireless.fcc.gov/auctions/44/factsheet.html>>.

²³⁹ Based on data available at the Commission’s Auction Form 175 database, available at <<http://auctionfiling.fcc.gov/form175/index.htm>> (last visited Mar. 12, 2002) (“*Form 175 Database*”).

have winning bidders in Auction No. 44, raising (in net high bids) a total of \$56.8 million.²⁴⁰ In that auction, 35 winning bidders won a total of 251 licenses.²⁴¹

98. As required by the Auction Reform Act, we have prepared a report announcing when we intend to reschedule the remaining 700 MHz band auctions, and submitted the report to Congress on June 19, 2003.²⁴²

e. Advanced Wireless Services

99. As previously mentioned, U.S. mobile carriers have the flexibility to deploy technologies, including those commonly called Third Generation or "3G," that allow them to offer high-speed mobile data services using their existing CMRS spectrum.²⁴³ Nevertheless, the Commission has continued its efforts over the past year to allocate and license additional spectrum suitable for offering advanced wireless services.²⁴⁴ As noted in the *Eighth Report*, in 2002 the Commission, together with the National Telecommunications and Information Administration ("NTIA"), allocated 90 megahertz of spectrum in the 1710-1755 and 2110-2155 MHz bands that can be used to offer advanced wireless services, including 3G services.

100. In November 2003, in WT Docket No. 02-353, the Commission released a *Report and Order* adopting service rules for licensed fixed and mobile services, including advanced wireless services, for the 90 megahertz of spectrum at 1710-1755 and 2110-2155 MHz.²⁴⁵ These service rules include application, licensing, operating and technical rules, and competitive bidding provisions. The Commission determined that this spectrum could be used for any wireless service that is consistent with the spectrum's fixed and mobile allocations and to license this spectrum under the Commission's flexible, market-oriented Part 27 rules.²⁴⁶ In order to meet a variety of needs, including the needs of both large and small service providers, the Commission adopted a band plan for this spectrum that included a variety of licensing areas and paired spectrum blocks.

101. Specifically, the Commission adopted a band plan using regional and localized service areas and employing symmetrically paired spectrum blocks with the pairings being comprised of different bandwidths. Under the band plan that the Commission adopted for this spectrum, 946 licenses will be made available to the public under the Commission's competitive bidding rules. The band plan permits spectrum to be easily aggregated. Economic Areas (EAs) can be aggregated to form Regional Economic Areas (REAGs) and Metropolitan Statistical Areas (MSAs) and Rural Service Areas (RSAs) allow

²⁴⁰ Lower 700 MHz Band Auction Closes, *Public Notice*, DA 03-1978 (rel. Jun. 18, 2003).

²⁴¹ *Id.*

²⁴² Auction Reform Act of 2002, *Report To Congress*, FCC 03-138 (rel. Jun. 19, 2003).

²⁴³ 47 C.F.R. §§ 20.901(a) and 24.3.

²⁴⁴ Advanced Wireless Services (AWS) is the collective term we use for new and innovative fixed and mobile terrestrial wireless applications using bandwidth that is sufficient for the provision of a variety of applications, including those using voice and data (such as internet browsing, message services, and full-motion video) content.

²⁴⁵ Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands, WT Docket No. 02-353, *Report and Order*, 18 FCC Rcd 25162 (2003); *petitions for reconsideration pending*.

²⁴⁶ 47 C.F.R. Part 27.

service providers to mix and match rural and urban areas according to their business plans.²⁴⁷ In addition, the band plan places the smaller spectrum blocks toward the middle of the bands to facilitate aggregation.

102. The Commission also decided not to impose ownership restrictions (other than those contained in Section 310 of the Communications Act), spectrum aggregation limits, eligibility restrictions, or interim performance requirements. The Commission did determine to limit the lower band (i.e., 1710-1755 MHz band) to mobile transmissions and the upper band (i.e., 2110-2155 MHz band) to base transmissions and established rules to protect co-channel and adjacent channel operations from interference. The Commission also determined to assign licenses for this spectrum using the Commission's Part 1 competitive bidding rules and award bidding credits of 15 percent for small businesses and 25 percent for very small businesses.

2. Other Potential Barriers to Entry

103. There are three other types of entry barriers, each of which captures separate dimensions of the difficulty of entering an industry. The first type consists of the impediment to entry erected by advertising expenditures. Unlike tangible capital, advertising can neither be resold nor otherwise transferred to prospective buyers. Upon its demise the advertiser can recover none of the money spent to promote its products; such expenditures are irrecoverable or sunk. While the incumbent has already incurred the sunk costs, the entrant has not. Therefore, the entrant has higher incremental cost and incremental risk associated with its decision to enter. According to Baumol and Willig, the two effects combine to lower expected profitability, thereby deterring entry.²⁴⁸ Bain, on the other hand, argues that higher advertising generates brand loyalty and scale economies for incumbent firms.²⁴⁹ To achieve these benefits and be on equal footing, an entrant must incur high selling costs, which increase with the advertising intensity of the industry. The high selling costs can depress expected profitability and dissuade entry. Both the selling and sunk cost aspects of advertising are typically measured by the advertising-to-sales ratio, a barometer of advertising intensity.²⁵⁰

104. The second type of entry barrier arises from economies of scale, which allow firms to lower the cost per unit of producing and distributing a product as the volume of output expands. The more extensive economies of scale are, the larger is the minimum efficient scale relative to the size of the market, meaning a nascent firm risks depressing market price by producing at optimal scale. The alternative is to produce at less than minimum cost. Either way, expected profitability is lowered, and entry is dissuaded. The minimum efficient scale is measured by the quotient of the average plant size among the largest plants accounting for 50 percent of output and total industry sales.²⁵¹ The resulting number, a percentage of total industry output, indicates what fraction of industry sales a new entrant must capture to be as efficient as a larger incumbent firm.

²⁴⁷ MSAs and RSAs are collectively referred to as Cellular Market Areas (CMAs).

²⁴⁸ William J. Baumol and Robert D. Willig, *Fixed Cost, Sunk Cost, Entry Barriers and Sustainability of Monopoly*, QUARTERLY JOURNAL OF ECONOMICS, Vol. 96, Aug. 1981, at 406-431.

²⁴⁹ Joe S. Bain, *Barriers to New Competition*, 1956, at 55 ("Barriers to New Competition").

²⁵⁰ William S. Comanor and Thomas A. Wilson, *Advertising Market Structure and Performance*, THE REVIEW OF ECONOMICS AND STATISTICS, Vol. 49, Nov. 1967), at 425 ("Advertising Market Structure and Performance").

²⁵¹ *Id.*, at 429.

105. The third type of entry barrier, and closely related to the second, is the inability of new firms to borrow sums sufficient to finance efficient start-ups. With the larger absolute capital requirement needed to realize minimum cost grows the inability to borrow sufficiently, erecting a staunch entry barrier. "That is, the absolute capital requirement may be so large that relatively few individuals or groups could secure the needed capital, or that entrants could secure it only at interest rates and other terms which placed them at a net cost disadvantage to established sellers."²⁵² The height of the barrier is usually measured by the minimum capital-requirement variable, which is the product of the capital-to-sales ratio and the average plant size among the largest plants accounting for 50 percent of output.²⁵³

106. All three types of entry barriers have the potential to afford incumbent carriers first-mover advantages over latecomers. We believe it is probable that the three types of entry barriers are high in CMRS mobile voice. Telecommunications has historically been an industry characterized by large investments in network infrastructure and vast scale economies, suggesting the scale economy and capital requirement barriers are both high. Increasing advertising expenditures by CMRS carriers as they seek to brand their products suggests that the product differentiation barrier in CMRS mobile voice is similarly high. As documented below in Section IV.B.4 on carrier rivalry with respect to advertising and marketing, total advertising expenditures by the six nationwide operators alone exceeded \$3 billion in 2003, and advertising expenditures per subscriber have been rising since 2001.²⁵⁴ We note, however, CTIA's suggestion that first-mover advantages may no longer be relevant to the CMRS industry given that non-cellular entrants such as T-Mobile and Nextel were leaders in adding subscribers in 2003.²⁵⁵

F. Rural Markets

1. Geographical Comparisons: Urban vs. Rural

107. Since the release of the *Sixth Report*,²⁵⁶ the Commission has attempted to obtain a better understanding of the state of competition below the national level, and particularly in rural areas.²⁵⁷ In order to analyze the mobile telecommunications market structure in rural areas, it is necessary first to define "rural areas." The federal government has multiple ways of defining rural, reflecting the multiple purposes for which the definitions are used.²⁵⁸ In the *Eighth Report*, the Commission analyzed service availability in rural areas using three different proxy definitions, and similar results were obtained for each definition.²⁵⁹ The Commission compared the number of competitors in: 1) RSA counties versus

²⁵² *Barriers to New Competition*, at 55.

²⁵³ *Advertising Market Structure and Performance*, at 428.

²⁵⁴ Section IV.B.4, Advertising and Marketing, *infra*.

²⁵⁵ *CTIA Comments*, at 31.

²⁵⁶ See *Sixth Report*, at 13350..

²⁵⁷ The Commission held a public forum in February 2002 to discuss, among other things, CMRS competition issues in rural areas. In addition, the *Eighth CMRS NOI* included questions on a range of rural wireless issues.

²⁵⁸ See *Eighth Report*, 18 FCC Rcd at 14834, ¶ 108-109. See also *Facilitating the Provision of Spectrum-Based Service to Rural Areas and Promoting Opportunities for Rural Telephone Companies to Provide Spectrum-Based Services*, 18 FCC Rcd 20802, 20808-11 ¶¶ 10-12 (2003) ("*Rural NPRM*").

²⁵⁹ See *Eighth Report*, 18 FCC Rcd at 14835-37, ¶¶ 111-121.

MSA counties; 2) non-nodal EA counties versus nodal EA counties;²⁶⁰ and 3) counties with population densities below 100 persons per square mile versus those with population densities above 100 persons per square mile.²⁶¹ In addition, the Commission released a *Notice of Proposed Rulemaking* in 2003 to examine ways to promote the rapid and efficient deployment of spectrum-based services in rural areas.²⁶² Similarly, as stated above, in its *Ninth CMRS NOI*, the Commission asked for comments on how the Commission should define “rural areas” for purposes of the *Ninth Report*.²⁶³

2. Definition of Rural

108. The Commission does not have a statutory definition of what constitutes a rural area. The Commission has used RSAs as a proxy for rural areas for certain purposes, such as the current cellular cross-interest rule and the former CMRS spectrum cap, stating that “other market designations used by the Commission for CMRS, such as [EAs], combine urbanized and rural areas, while MSAs and RSAs are defined expressly to distinguish between rural and urban areas.”²⁶⁴ In its recently adopted report and order concerning deployment of wireless services in rural areas, the Commission adopted a default definition of “rural” as a county with a population density of 100 persons or fewer per square mile.²⁶⁵ For this reason, we adopt this same definition to analyze service availability in rural areas for this report.²⁶⁶

3. Rural Competition

109. In comparing competitive entry in counties with population densities of 100 persons per square mile or less to those with densities greater than 100 persons per square mile, we find that the less densely populated counties have an average of 3.7 mobile competitors, while the more densely populated counties have an average of 5.9 competitors.

110. Rural Cellular Association members can participate in a voluntary survey, similar to CTIA’s

²⁶⁰ Each EA consists of one or more counties that are “Economic Nodes” and the surrounding counties that are economically related to it. An EA may have more than one economic node. The counties that are economic nodes are metropolitan areas or similar areas that serve as the EA’s center(s) of economic activity. As a proxy for urban and rural geographic areas, the Commission looked at counties which make up economic nodes, i.e. nodal counties, versus those counties that do not make up economic nodes, i.e. non-nodal counties. See *Eighth Report*, 18 FCC Rcd at 14836, ¶ 112.

²⁶¹ See *Eighth Report*, 18 FCC Rcd at 14836, ¶ 114.

²⁶² See *Rural NPRM*, 18 FCC Rcd at 20803-04, ¶1.

²⁶³ See note 11, *supra*.

²⁶⁴ Biennial Regulatory Review, Spectrum Aggregation Limits for Wireless Telecommunications Carriers, *Report and Order*, 15 FCC Rcd 9219, 9256 at note 203 (1999).

²⁶⁵ *Rural Order PN*.

²⁶⁶ We note that this definition is supported by many of the commenters. See *CTIA Comments*, at 11; *RSA Comments*, at 5; *RTC Reply Comments*, at 3. One commenter suggested using a 25 persons per square mile definition, but we rejected that definition in the *Eighth Report*. *Blooston Rural Carrier Comments*, at 7; *Eighth Report*, at 14836.

biannual survey, conducted by Keisling Associates, LLP ("*Keisling RCA Survey*").²⁶⁷ For 2002 (the most recent survey results available), the survey showed that there was an average of 5.1 wireless competitors in survey participants' markets, having increased steadily from 3.0 competitors in the 1998 *RCA Survey*.²⁶⁸ RCA concludes that the survey indicates that there is "robust and effective competition, increasing year-to-year, in the markets served by RCA members." The *Keisling RCA Survey* also presented evidence of increasing customer usage and declining per minute pricing in rural areas, similar to trends that we have seen nationally.²⁶⁹

4. Conclusion

111. Based on our rollout analysis and information provided by commenters, we conclude that CMRS providers are competing effectively in rural areas.²⁷⁰ While it appears that, on average, a smaller number of operators are serving rural areas than urban areas, this difference does not necessarily indicate that effective CMRS competition does not exist in rural areas. In this regard, we note that the average number of mobile operators estimated to be serving rural areas in the United States is greater than the total number of national mobile operators serving countries with a reputation of having highly advanced mobile service markets such as Japan, South Korea, and Finland. In addition, data and statements presented by commenters on the *Ninth CMRS NOI* support the conclusion that effective CMRS competition does exist in rural areas. Finally, we emphasize that market structure is only a starting point for a broader analysis of the status of competition based on the totality of circumstances, including the pattern of carrier conduct, consumer behavior, and market performance.

IV. CARRIER CONDUCT IN THE MOBILE TELECOMMUNICATIONS MARKET

112. A concentrated market, in conjunction with significant entry barriers, may lessen competition in the market for commercial mobile services in two distinct ways. First, it may increase the likelihood that a group of competing carriers will successfully engage in coordinated interaction aimed at raising prices and lowering output. Second, it may enable an individual carrier to profitably raise price and lower output unilaterally. However, neither coordinated interaction nor unilateral action to lessen competition is a necessary consequence of market concentration and entry barriers. For example, unilateral or coordinated action to lessen competition may be thwarted or undermined by the presence of one or more maverick carriers who have the ability and incentive to expand sales by undercutting the prices of rivals, offering innovative service packages and engaging in aggressive advertising and

²⁶⁷ See *RCA Comments*, at 2.

²⁶⁸ See Appendix A, Table 6: Keisling RCA Survey, at A-9. We note that this analysis is not directly comparable with our own, since the *Keisling RCA Survey* measures competitors by market (which is undefined) while ours is county-based.

²⁶⁹ See Appendix A, Table 6: Keisling RCA Survey, at A-9. We note that RCA represents companies that serve markets where 14.6 million people reside. *RCA Comments*, at note 1. Thus, the *Keisling RCA Survey* results represent 25 percent of rural customers, since the 2000 Census found that 59 million people were "rural." See *Eighth Report*, at 14836.

²⁷⁰ See, e.g., *CTIA Comments*, at 8 ("The wireless industry has consistently provided highly competitive services throughout all regions of the U.S., including rural America"); *RCA Comments*, at 7 ("RCA members are competitive in their wireless service offering").

promotional campaigns.²⁷¹ The analysis of carrier conduct thus focuses on whether incumbent carriers, given the prevailing market structure, engage in intense price and non-price rivalry or instead behave as if they are content to live peacefully with one another.

A. Price Rivalry

1. Developments in Mobile Telephony Pricing Plans

113. The continued rollout of differentiated pricing plans also indicates a competitive marketplace. In the mobile telephone sector, we observe independent pricing behavior, in the form of continued experimentation with varying pricing levels and structures, for varying service packages, with various available handsets and policies on handset pricing. AT&T Wireless's Digital One Rate plan, introduced in May 1998, is one notable example of an independent pricing action that altered the market and benefited consumers.²⁷² Today all of the nationwide operators offer some version of a national rate pricing plan in which customers can purchase a bucket of MOUs to use on a nationwide or nearly nationwide network without incurring roaming or long distance charges.

114. Another trend in mobile telephone pricing has been the expansion of free calling among a particular company's customers, known as "in-network" or "mobile-to-mobile" calling.²⁷³ Such callers do not have to pay any additional fees for incoming or outbound calls with other subscribers of the same company. In January 2004, AT&T announced that new customers who sign a two-year contract for plans of at least \$40 monthly would also receive unlimited mobile-to mobile calling, as long as they call from their mobile-to-mobile calling area.²⁷⁴ In February 2004, Verizon Wireless added unlimited in-network calling to "America's Choice" calling plans of at least \$40 a month.²⁷⁵ Also in February, Cingular Wireless launched a new suite of national rate plans, "Cingular Nation GSM," where customers received 5,000 mobile-to-mobile minutes to use on its GSM network (since expanded to unlimited) on plans starting at \$50 a month.²⁷⁶ Sprint PCS also offers unlimited in-network calling on its "Free & Clear Nationwide" plans for an additional \$5 per month.²⁷⁷

²⁷¹ An example is when AT&T introduced its digital-one-rate plan in May 1998, which was the first plan to include a large quantity of monthly minutes at a fixed rate and no long distance charges when used on the operator's network. See *Fourth Report*, at 10155, and *Fifth Report*, at 17677-78.

²⁷² See *AT&T Launches First National One-Rate Wireless Service Plan*, News Release, AT&T Corp., May 7, 1998.

²⁷³ The carriers' plans described below had previously included 1,000 "in-network" minutes. Jesse Drucker, *AT&T Verizon Go 'Unlimited' As Wireless Battle Accelerates*, WALL STREET JOURNAL, Feb. 2, 2004, at B5; Dan Meyer, *Party's Over, Carriers Hike Rate Plans*, RCR WIRELESS NEWS, Feb. 9, 2004.

²⁷⁴ *Groundbreaking AT&T Wireless Offer Provides Free, Unlimited Mobile-To-Mobile Calling*, News Release, AT&T Wireless, Jan. 30, 2004. Existing customers on such plans can request the new offer at no charge. *Id.*

²⁷⁵ Dan Meyer, *Party's Over, Carriers Hike Rate Plans*, RCR WIRELESS NEWS, Feb. 9, 2004; Jesse Drucker, *AT&T Verizon Go 'Unlimited' As Wireless Battle Accelerates*, WALL STREET JOURNAL, Feb. 2, 2004, at B5.

²⁷⁶ *Cingular's New Mobile-To-Mobile Plan Offers Customers More Coverage, More Advantages*, News Release, Cingular Wireless, Feb. 10, 2004; Cingular Wireless, *Rate Plans* (visited May, 27, 2004) <www.cingular.com>.

²⁷⁷ Dan Meyer, *Party's Over, Carriers Hike Rate Plans*, RCR WIRELESS NEWS, Feb. 9, 2004.

2. Prepaid Service

115. In the United States, most mobile telephony subscribers pay their phone bills after they have incurred charges (known as postpaid service). Prepaid service, in contrast, requires customers to pay for a fixed amount of minutes prior to making calls. Although prepaid plans are considered a good way to increase penetration rates, they typically produce lower ARPU's and higher churn rates in comparison to postpaid subscribers.²⁷⁸

116. One analyst estimated that 6 percent of U.S. wireless phone users subscribed to prepaid plans in 2003, roughly what we found in the *Eighth Report*.²⁷⁹ AT&T Wireless, Cingular Wireless, and Verizon Wireless all had about 6 percent of subscribers on prepaid plans, while T-Mobile had about 11 percent. Sprint PCS and Nextel have partnered with third-party resellers to market prepaid offerings aimed at the youth portion of the population.²⁸⁰

3. Mobile Data Pricing

117. In addressing both price-rivalry and non-price rivalry in the mobile data market, it is useful to divide the market into two distinct segments.²⁸¹ The first segment consists of simple handset-based applications marketed to consumers primarily as an add-on to mobile voice service, including text messaging ("SMS"), multimedia messaging services ("MMS") such as photo messaging, and entertainment applications such as ring tones and games. The second segment consists of monthly mobile Internet access service packages for customers who wish to connect to wireless networks primarily or exclusively for data, rather than voice use, and who typically access the Internet through laptops or Personal Digital Assistants ("PDAs"). Given the limited coverage to date of high-speed wireless data networks and the slow speeds, relative to fixed broadband, of wireless network technologies that are widely available today, the first segment is more developed than the second.²⁸²

118. As detailed in the *Eighth Report*, in the first half of 2003 mobile carriers were experimenting with a variety of different options for pricing and measuring usage of handset-based applications, including pricing based on kilobytes consumed, flat rate pricing for each use of an application ("pay-as-you-go"), volume discounts on bundled packages of an application, and unlimited use pricing.²⁸³ Use of

²⁷⁸ See *Eighth Report*, at 14830. See, also, *Nextel Communications, Inc.*, Raymond James & Associates, Equity Research, Feb. 9, 2004, at 15. However, in the trial stage of its prepaid offering, Boost Mobile, Nextel found that customers were using, on average, 300 MOUs, two to three times the minutes used by prepaid customers of other carriers. *Virtual Networks Make a Splash in 2003*, KAGAN WIRELESS MARKET STATS, Feb. 27, 2004, at 6.

²⁷⁹ David Janazzo et al., *US Wireless Matrix 4Q03*, Merrill Lynch, Equity Research, Mar. 15, 2004, at 1, ("US Wireless Matrix 4Q03"); *Eighth Report*, at 14830.

²⁸⁰ See Section III.B.2, Resale Providers, *supra*.

²⁸¹ See Frank J. Governali, Robert D. Barry, and Marje Soova, *Wireless Data Prospects Brightening*, Goldman Sachs, Global Investment Research, Apr. 16, 2004, at 31 and 34, ("Wireless Data Prospect Brightening"); *Eighth Report*, at 14843-14844.

²⁸² *Id.*, at 34. See also Section IV.B.1, Technology Deployment and Upgrades, *infra*.

²⁸³ See *Eighth Report*, at 14843-14856 and 14905-14907.